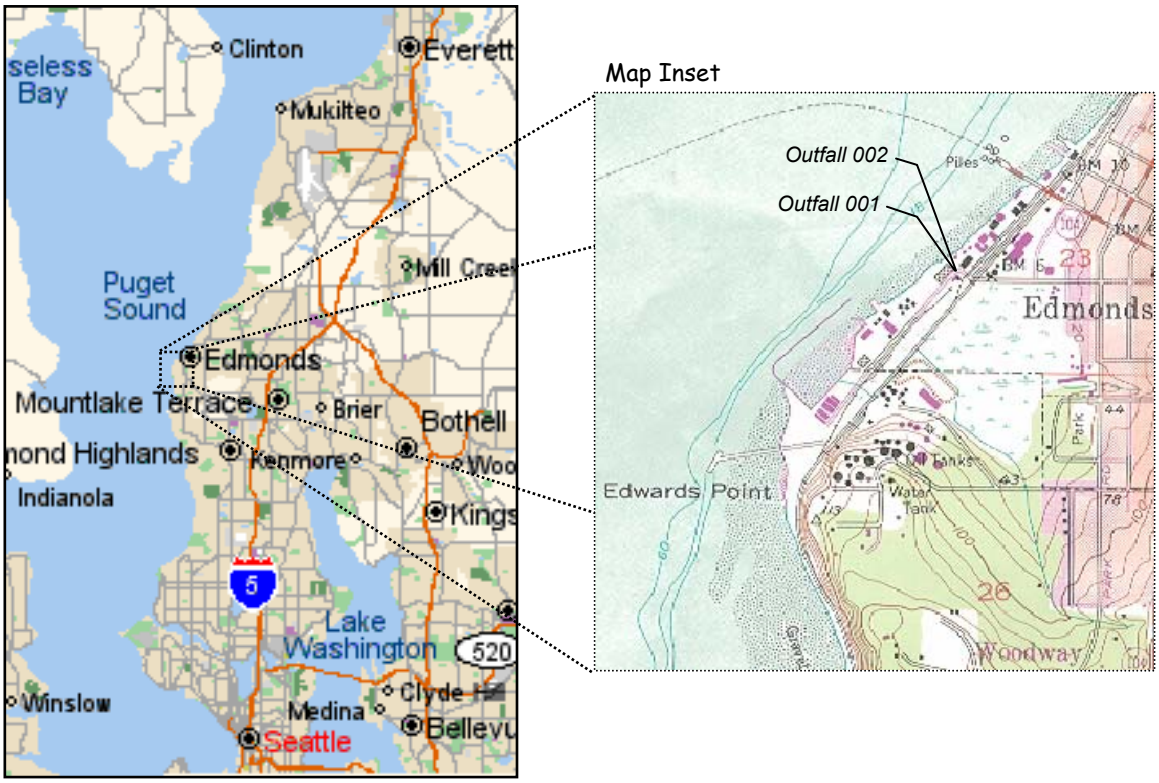
FACT SHEET FOR NPDES PERMIT WA-002405-8
CITY OF EDMONDS WWTP



This fact sheet is a companion document to the draft National Pollutant Discharge Elimination System (NPDES) Permit for the City of Edmonds Wastewater Treatment Plant (WWTP). The fact sheet explains the nature of the proposed discharge, the Department of Ecology's (the Department's) decisions on limiting the pollutants in the wastewater, and the regulatory and technical basis for those decisions. The fact sheet and draft permit are available for review (see *Appendix A--Public Involvement* for more detail on the Public Notice procedures). A glossary of terms used in the fact sheet and permit are included in Appendix B.

GENERAL INFORMATION			
Applicant	City of Edmonds		
Facility Name and Address	City of Edmonds WWTP Second Avenue and South Dayton Street Edmonds, Washington		
Type of Treatment	Activated sludge		
Discharge Location	Puget Sound	*Outfall 001*	*Outfall 002*
	Latitude:	47° 48' 45" N	47° 48' 50" N
	Longitude:	122° 23' 21" W	122° 23' 20" W
Water Body ID Number	WA-PS-0240		

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the State of Washington to administer the NPDES permit program. Chapter 90.48 RCW defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see *Appendix A--Public Involvement* of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

The Edmonds WWTP serves a population of approximately 70,000 people. The primary source of wastewater tributary to the facility is domestic sewage from residential and light commercial activities in the City of Edmonds, City of Mountlake Terrace, the Ronald Wastewater Management District, the Olympic View Water and Sewer District, and the Town of Woodway. In addition, the waste water tributary to the old King County Richmond Beach WWTP has been diverted to the Edmonds WWTP in a flow swap agreement with King County. The amount of flow diverted to Edmonds varies seasonally.

History

The primary treatment facility was originally brought online in 1959. The facility was upgraded from primary to secondary treatment in 1991 with the installation of activated sludge and secondary clarification systems. Major modifications to the WWTP since 1991 include the installation of a dechlorination system and a backup generator in 1997.

Collection System Status

The collection system for the Edmonds WWTP was brought online in 1959. The City of Edmonds maintains the collection system that feeds the Edmonds WWTP. There are approximately 15 lift stations that convey wastewater to the plant from Mountlake Terrace, Edmonds, Richmond Beach, Woodway, and some from Shoreline and Lynnwood.

Treatment Processes

The treatment facility includes mechanically cleaned bar screens, influent flow measurement, raw sewage pumping, primary clarification, fine bubble diffuser aeration basins, secondary clarification, disinfection with chlorine, dechlorination with sodium bisulfite, and an effluent pump station. Screenings removed from the mechanical bar screens are ground and mixed with primary and secondary sludge for incineration. Sludge removed from the primary and secondary clarifiers is dewatered in a belt filter press, then combined with the ground screenings and concentrated scum and incinerated in a fluidized bed incinerator. Ash from the incinerator is thickened, dewatered by a vacuum filter, and ultimately disposed of at the Roosevelt Landfill in eastern Washington.

Discharge Outfall

The treated and disinfected effluent from the WWTP is discharged to a single upland outfall pipe but bifurcates at the beach into two submerged 36 inch diameter outfalls. Each outfall is equipped with a 160 multi-port diffuser. Outfall 001 terminates in water with an average depth of -66 MLLW; outfall 002 terminates in water with an average depth of -58 MLLW.

Residual Solids

Residual solids generated at the wastewater treatment plant include screenings, grit, scum, primary sludge, secondary sludge, and incinerator ash. Screenings are ground, dewatered, and combined with other residual solids for incineration. Scum removed from the primary and secondary clarifiers is either mixed with primary and secondary sludge prior to dewatering or may be routed to the scum concentrator. Concentrated scum is either mixed with screenings and dewatered prior to incineration, or it is directly incinerated. Primary and secondary waste activated sludges are combined in static mixers, conditioned, and dewatered on belt filter presses. Dewatered sludges are combined with grit, scum, and screenings for incineration. Ash from the incinerator is thickened, dewatered by a vacuum filter and ultimately disposed of at the Roosevelt Landfill.

PERMIT STATUS

The previous permit for this facility was issued on June 26, 1997, and revised on March 29, 1999. The previous permit placed effluent limitations on 5-day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$), Total Suspended Solids (TSS), pH, Fecal Coliform bacteria, residual Chlorine and acute toxicity.

An application for permit renewal was submitted to the Department on December 13, 2001, and accepted by the Department on June 19, 2002.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its last inspection on April 15, 2003. This inspection was a Class II compliance inspection. Effluent samples were split to determine the comparability of Ecology and Edmond's laboratory results and sampling methods. The effluent sample results were all in close agreement. All inspection reports are in the facility's record file at the Northwest Regional Office of the Department.

During the history of the previous permit, the Permittee has remained in compliance, based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department. The only non-compliance occurred in March 2000 with a fecal coliform exceedance.

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. Based on monthly average data from 7/97 to 5/03 (see Appendix F), the effluent is characterized as shown in Table 1.

Table 1: Wastewater Characterization

Parameter	Concentration
$CBOD_5$	5 mg/L
TSS	7 mg/L
pH	6.9 - 7.3
Chlorine	65 μg/L

source: DMR data

PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57,

No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent**.** Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation**.** Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

In accordance with Washington Administrative Code (WAC) 173-220-130(1)(a), effluent limitations shall not be less stringent than those based upon the design criteria for the facility, which are contained in approved engineering plans, reports, or approved revisions. Also, in accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility were taken from the approved plans and specifications prepared by CWC-HDR Inc. and the amended engineering report prepared by the city of Edmonds. These criteria are summarized in Table 2.

Table 2: Design Standards for Edmonds WWTP

Parameter	Design Quantity
Monthly average flow (max month)	11.8 MGD
BOD influent loading	19,200 lb/day
TSS influent loading	20,000 lb/day

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The technology-based limits for pH, fecal coliform, BOD_5, and TSS are taken from Chapter 173-221 WAC and are displayed in Table 3.

Table 3: Technology-based Limits

Parameter	Limit
pH:	Shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL
$CBOD_5$ (concentration)	Average Monthly Limit is the most stringent of the following: - 25 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 40 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
$CBOD_5$ (mass)	Average Monthly Limit = 2460 lb/day Average Weekly Limit = 3936 lb/day
TSS (mass)	Average Monthly Limit = 2952 lb/day Average Weekly Limit = 4430 lb/day

The following TSS technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

> Monthly effluent TSS mass loadings (lb/day) were calculated as the maximum monthly design flow (11.8 MGD) x Concentration limit (30 mg/L) x 8.34 (conversion factor) = mass limit (2952 lb/day).
>
> The weekly average effluent TSS mass loading is calculated as maximum monthly design flow (11.8 MGD) x Concentration limit (45 mg/L) x 8.34 (conversion factor) = mass limit (4430 lb/day).

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

Numerical Criteria for the Protection of Aquatic Life

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

Numerical Criteria for the Protection of Human Health

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

Narrative Criteria

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

Antidegradation

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when receiving waters are of higher quality than the criteria assigned, the existing water quality shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

Critical Conditions

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

MIXING ZONES

The Water Quality Standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100. The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Puget Sound which is designated as a Class AA Marine receiving water in the vicinity of the outfall. Other nearby point source outfalls include Lynwood STP approximately three miles to the northeast, and the Kingston STP approximately three miles to the west. Characteristic uses include the following:

> water supply (domestic, industrial, agricultural); stock watering; fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall markedly and uniformly exceed the requirements for all or substantially all uses.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized in Table 6.

Table 6: Water Quality Criteria for Class AA Waters

Parameter	Class AA WQ Criteria
Fecal Coliforms	14 organisms/100 mL maximum geometric mean
Dissolved Oxygen	7 mg/L minimum
Temperature	13 degrees Celsius maximum or incremental increases above background
pH	7.0 to 8.5 standard units
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix H for numeric criteria for toxics of concern for this discharge)
Ammonia*	One-hour (acute) average concentration of 10.54 mg/L total ammonia (8.66 mg/L as N). Four-day (chronic) average concentration of 1.58 mg/L total ammonia (1.3 mg/L as N).

* at pH 8.0, salinity 25.4 g/kg, temperature 14.5˚ C, near worst-case conditions recorded at the Admiralty Inlet, South (ADM003) ambient monitoring station from 1/19/00-12/11/00. See Appendix I for a spreadsheet of these calculations.

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

> The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of the UM model. The dilution factors have been determined to be as follows:

	Acute	Chronic
Aquatic Life	46	390
Human Health, Carcinogen		390
Human Health, Non-carcinogen		390

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

BOD_5--This discharge with technology-based limitations results in a small amount of BOD loading relative to the large amount of dilution occurring in the receiving water at critical conditions. Technology-based limitations will be protective of dissolved oxygen criteria in the receiving water.

Temperature—Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, no effluent limitation for temperature was placed in the proposed permit.

pH--Because of the high buffering capacity of marine water, compliance with the technology-based limits of 6 to 9 will assure compliance with the Water Quality Standards for Surface Waters.

Fecal coliform--The numbers of fecal coliform were modeled by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml and a dilution factor of 390:1. Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters with the technology-based limit. Therefore, the technology-based effluent limitation for fecal coliform bacteria was placed in the proposed permit.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for

those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: chlorine, ammonia, heavy metals, and a couple of pollutants from EPA's list of 126 priority pollutants. A reasonable potential analysis was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.

The determination of the reasonable potential for all detected priority pollutants and ammonia to exceed the water quality criteria was evaluated with procedures given in EPA, 1991. The results are displayed in Appendices J and K for aquatic life and human health criteria, respectively. The parameters used in the critical condition modeling are as follows: acute dilution factor 46:1, chronic dilution factor 390:1. Water quality criteria for metals in Chapter 173-201A WAC are based on the dissolved fraction of the metal.

No valid ambient background data was available for ammonia, heavy metals, or the priority pollutants. A determination of reasonable potential using zero for background resulted in no reasonable potential for these toxics; therefore no limits have been placed for these toxics.

A water quality limit has been determined for chlorine. The existing permit has an average monthly chlorine limit of 228 µg/L and the facility has been able to comply with it since the installation of dechlorination equipment. The proposed permit includes the same limit. The spreadsheet used to calculate this limit is shown in Appendix L.

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sub-lethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC_{50}, EC_{50}, IC_{25}, etc. All accredited labs have been provided the most

recent version of the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* which is referenced in the permit. Any Permittee interested in receiving a copy of this publication may call the Ecology Publications Distribution Center 360-407-7472 for a copy. Ecology recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

Acute toxicity was measured during acute toxicity compliance testing in the previous permit term. Acute toxicity was found to be at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity. An acute toxicity limit is therefore required. The acute toxicity limit is no statistically significant difference in test organism survival between the acute critical effluent concentration (ACEC), 2.17% of the effluent, and the control.

The acute toxicity limit is set relative to the zone of acute criteria exceedance (acute mixing zone) established in accordance with WAC 173-201A-100. The acute critical effluent concentration (ACEC) is the concentration of effluent existing at the boundary of the acute mixing zone during critical conditions.

Monitoring for compliance with an acute toxicity limit is accomplished by conducting an acute toxicity test using a sample of effluent diluted to equal the ACEC and comparing test organism survival in the ACEC to survival in nontoxic control water. The Permittee is in compliance with the acute toxicity limit if there is no statistically significant difference in test organism survival between the ACEC and the control.

The results of the acute toxicity tests performed during the previous permit period occasionally showed less than 65% specie survival in 100% effluent. This is why acute compliance is again required in the proposed permit. Since fish were usually the organism most affected, ammonia is a likely cause of death. The lab performing the WET testing should be advised to control pH rise during future tests in order to avoid artifactual toxicity. This is in response to the concern that an increase in pH during WET testing creates an artifactual toxicity when ammonia is present. Techniques and guidance for controlling test pH using a CO_2-controlled atmosphere are provided in Mount and Mount's *A simple method of pH control for static and static renewal aquatic toxicity test*s (Environmental Toxicology Chemistry 11:609-614). In addition, the tests should be performed at 20° C instead of 25° C to minimize the conversion of NH_4 to toxic NH_3 during testing.

The chronic WET tests performed during effluent characterization indicate that no reasonable potential exists to cause receiving water chronic toxicity. The Permittee will not be given a chronic WET limit and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that chronic toxicity has not increased in the effluent.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard". The Permittee may demonstrate to the Department that changes have not

increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the effluent is likely to have chemicals of concern for human health. The discharger's high priority status is based on the discharger's status as a major discharger and the knowledge of data indicating regulated chemicals occur in the discharge.

A determination of the discharge's potential to cause an exceedance of the water quality standards was conducted as required by 40 CFR 122.44(d). The reasonable potential determination was evaluated with procedures given in the Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001) and the Department's Permit Writer's Manual (Ecology Publication 92-109, July, 1994). The determination indicated that the discharge has no reasonable potential to cause a violation of water quality standards, thus an effluent limit is not warranted.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

In 1995, a sediment study was conducted in the vicinity of the discharge. The results show that, after correcting for possible laboratory contamination, four stations had Bis(2-ethylhexyl)phthalate levels exceeding the sediment quality standard (SQS), with three of the four stations exceeding sediment cleanup screening levels (CSL) (WAC 173-204-520). In addition, five different PAHs were detected at station E05 in excess of the SQS, two of which also exceeded the CSL; this resulted in station E05 exceeding the SQS for total HPAHs. These results warrant additional sediment testing, therefore a condition has been placed in the proposed permit which requires an additional characterization study of sediments in the vicinity of the discharge.

The sediment characterization study will document whether or not these potential contaminants are present in sufficient concentrations to require further actions, such as source control or sediment cleanup. Such actions, if necessary, will be addressed during the next permit cycle.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100). This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED 6/26/1997

The effluent limits proposed in this permit are the same as those in the existing permit issued June 26, 1997 and modified March 29, 1999.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

Monitoring for priority pollutants, ammonia, nitrogen agents, oil and grease, phosphorus, and total dissolved solids is being required to further characterize the effluent. These pollutants could have a significant impact on the quality of the surface water.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Monitoring frequencies for TSS, CBOD, and fecal coliform are consistent with the previous permit, but are less than those recommended for activated sludge facilities with design flows greater than 5.0 MGD. The decision to keep the reduced monitoring schedule is warranted by the facility's excellent compliance record over the previous permit cycle with this same schedule. Edmonds, on average, operates at 19 and 17% of the permit requirements for TSS and CBOD, respectively (percentages represent [Long Term Average, mg/L]/ [Average Monthly Limit, mg/L]). For fecal coliform the ratio of LTA to AML is 24%. The relatively low coefficients of variance (COV) for TSS and CBOD, 58 and 27% respectively, also support this reduced monitoring schedule. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (July 2002).

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories.* The laboratory at this facility is accredited for BOD_5/$CBOD_5$, chlorine (residual), DO, pH, TSS, and fecal coliform. The LAN (lab accreditation number) is M0009.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4. to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4. restricts the amount of flow.

OPERATION AND MAINTENANCE (O&M)

The proposed permit contains condition S.5. as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems the Permittee is required in permit condition S7. to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by Ecology under Chapter 70.95J RCW and Chapter 173-308 WAC. The disposal of other solid waste is under the jurisdiction of the Snohomish Health District.

PRETREATMENT

Federal and State Pretreatment Program Requirements

Under the terms of the addendum to the "Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10" (1986), the Department of Ecology (Department) has been delegated authority to administer the Pretreatment Program (i.e. act as the Approval Authority for oversight of delegated Publicly Owned Treatment Works (POTWs))**.** Under this delegation of authority, the Department has exercised the option of issuing wastewater discharge permits for significant industrial users

discharging to POTWs which have not been delegated authority to issue wastewater discharge permits.

There are a number of functions required by the Pretreatment Program which the Department is delegating to such POTWs because they are in a better position to implement the requirements (e.g. tracking the number and general nature of industrial dischargers to the sewerage system). The requirements for a Pretreatment Program are contained in Title 40, part 403 of the Code of Federal Regulations. Under the requirements of the Pretreatment Program (40 CFR 403.8(f)(1)(iii)), the Department is required to approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) (40 CFR 403.8 (f)(1)(i)).

The Department is responsible for issuing State Waste Discharge Permits to SIUs and other industrial users of the Permittee's sewer system. Industrial dischargers must obtain these permits from the Department prior to the Permittee accepting the discharge (WAC 173-216-110(5)) (Industries discharging wastewater that is similar in character to domestic wastewater are not required to obtain a permit. Such dischargers should contact the Department to determine if a permit is required.). Industrial dischargers need to apply for a State Waste Discharge Permit sixty days prior to commencing discharge. The conditions contained in the permits will include any applicable conditions for categorical discharges, loading limitations included in contracts with the POTW, and other conditions necessary to assure compliance with State water quality standards and biosolids standards.

The Department requires this POTW to fulfill some of the functions required for the Pretreatment Program in the NPDES permit (e.g. tracking the number and general nature of industrial dischargers to the sewage system). The POTW's NPDES permit will require that all SIUs currently discharging to the POTW be identified and notified of the requirement to apply for a wastewater discharge permit from the Department. None of the obligations imposed on the POTW relieve an industrial or commercial discharger of its primary responsibility for obtaining a wastewater discharge permit (if required), including submittal of engineering reports prior to construction or modification of facilities (40 CFR 403.12(j) and WAC 173-216-070 and WAC 173-240-110, et seq.).

Wastewater Permit Required

RCW 90.48 and WAC 173-216-040 require SIUs to obtain a permit prior to discharge of industrial waste to the Permittee's sewerage system. This provision prohibits the POTW from accepting industrial wastewater from any such dischargers without authorization from the Department.

Requirements for Routine Identification and Reporting of Industrial Users

The NPDES permit requires non-delegated POTWs to " take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging to the Permittee's sewerage system". Examples of such routine measures include regular review of business tax licenses for existing businesses and review of water billing records

and existing connection authorization records. System maintenance personnel can also be diligent during performance of their jobs in identifying and reporting as-yet unidentified industrial dischargers. Local newspapers, telephone directories, and word-of-mouth can also be important sources of information regarding new or existing discharges. The POTW is required to notify an industrial discharger, in writing, of their responsibilities regarding application for a State waste discharge permit and to send a copy of the written notification to the Department. The Department will then take steps to solicit a State waste discharge permit application.

Annual Submittal of List of Industrial Users

This provision requires the POTW to submit annually a list of existing and proposed SIUs and PSIUs. This requirement is intended to update the Department on an annual basis of the status of industrial users in the POTW's service area, without requiring the POTW to go through the process of performing a formal Industrial User Survey. This provision is normally applied to POTWs not serving industrial or commercial users. Although this permit does not require execution of an Industrial User Survey, the Permittee is nevertheless required under the previous section, to take adequate continuous routine measures to identify existing and new industrial discharges.

Duty to Enforce Discharge Prohibitions

This provision prohibits the POTW from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer. The first portion of the provision prohibits acceptance of pollutants which cause pass through or interference. The definitions of pass through and interference are in Appendix B of the fact sheet.

The second portion of this provision prohibits the POTW from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition wastes with excessive BOD, petroleum based oils, or which result in toxic gases are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

The third portion of this provision prohibits certain types of discharges unless the POTW receives prior authorization from the Department. The discharges include cooling water in significant volumes, stormwater and other direct inflow sources, and wastewaters significantly affecting system hydraulic loading, which do not require treatment.

Support by the Department for Developing Partial Pretreatment Program by POTW

The Department has committed to providing technical and legal assistance to the Permittee in fulfilling these joint obligations, in particular assistance with developing an adequate sewer use ordinance, notification procedures, enforcement guidelines, and developing local limits and inspection procedures.

OUTFALL EVALUATION

Proposed permit condition S.12 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this permit be issued for five (5) years.

REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Metcalf and Eddy.

1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

Laws and Regulations(http://www.ecy.wa.gov/laws-rules/index.html)

Permit and Wastewater Related Information (http://www.ecy.wa.gov/programs/wq/wastewater/index.html

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

Water Pollution Control Federation.

1976. Chlorination of Wastewater.

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on September 4 and 11, 2001 in the Everett Herald to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department published a Public Notice of Draft (PNOD) on December 18, 2003, in The Everett Herald to inform the public that a draft permit and fact sheet were available for review. Interested persons were invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents were available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Northwest Regional office
3190 160th Ave SE
Bellevue, WA 98008

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (425) 649-7062, or by writing to the address listed above.

APPENDIX B--GLOSSARY

Acute Toxicity--The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

AKART-- An acronym for "all known, available, and reasonable methods of prevention, control, and treatment".

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation -- The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

$CBOD_5$ – The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celsius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD5 is given in 40 CFR Part 136.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring –Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial User-- A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

Pass through -- A discharge which exits the POTW into waters of the State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;

b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)--

1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;

2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at:
http://www.ecy.wa.gov/programs/wq/wastewater/index.html

Calculation of Water Quality-Based Effluent Limits

Water quality-based effluent limits are calculated by the two-value wasteload allocation process as described on page 100 of the TSD (EPA, 1991) and shown below.

1. Calculate the acute wasteload allocation WLA_a by multiplying the acute criteria by the acute dilution factor and subtracting the background factor. Calculate the chronic wasteload allocation (WLA_c) by multiplying the chronic criteria by the chronic dilution factor and subtracting the background factor.

   WLA_a = (acute criteria x acute zone dilution factor) - (bkgrnd conc.x (acute zone dilution factor - 1))

   WLA_c = (chronic criteria x chronic zone dilution factor) - (bkgrnd conc. x (chronic zone dilution factor -1))

2. Calculate the long term averages (LTA_a and LTA_c) which will comply with the wasteload allocations WLA_a and WLA_c.

   $LTA_a = WLA_a \times e^{[0.5\sigma^2 - z\sigma]}$ where: $\sigma^2 = \ln[CV^2 + 1]$, $z = 2.326$, CV = coefficient of variation = std. dev./mean

   $LTA_c = WLA_c \times e^{[0.5\sigma^2 - z\sigma]}$ where: $\sigma^2 = \ln[(CV^2 \div 4) + 1]$, $z = 2.326$

3. Use the smallest LTA of the LTA_a or LTA_c to calculate the maximum daily effluent limit and the monthly average effluent limit.

   Maximum Daily Limit = MDL

   $MDL = LTAx\, e^{(Z\sigma - 0.5\sigma^2)}$ where: $\sigma^2 = \ln[CV^2 + 1]$, $z = 2.326$ (99th percentile occurrence), LTA = Limiting long term average

   Average Monthly Limit = AML

   $AML = LTAx\, e^{(Z\sigma_n - 0.5\sigma_n^2)}$ where: $\sigma^2 = \ln[(CV^2 \div n) + 1]$, n = number of samples/month, $z = 1.645$ (95^{th} % occurrence probability), LTA = Limiting long term average

APPENDIX C— (CONT'D) — MIXING ZONE MODEL OUTPUT – ACEC

```
Mar 11, 1997,  13:22:18  ERL-N PROGRAM PLUMES, Ed 3, 3/11/94  Case:   1 of   8
Title   EDMONDS OUTFALL 001 SUMMER STRATIFICATION(10%tile V= 2cm/s)    linear
 tot flow   # ports port flow   spacing  effl sal effl temp   far inc   far dis
   0.2213         7   0.03161        30       0.0        20     8.108     81.08
 port dep  port dia plume dia total vel horiz vel vertl vel asp coeff print frq
    20.12    0.1270   0.09919     4.091     4.091     0.000      0.10        50
port elev ver angle cont coef  effl den poll conc     decay  Froude # Roberts F
   0.6096       0.0      0.61  -1.73284       100         0     26.45   0.03146
hor angle red space p amb den p current   far dif   far vel K:vel/cur Stratif #
       90     30.00   22.8293   0.02000    0.0003      0.02     204.6 0.0002688
    depth   current   density  salinity      temp  amb conc  N (freq) red grav.
      0.0      0.02     21.49                                  0.02526    0.2413
     33.5      0.02     23.72                                buoy flux puff-ther
                                                             0.0002543     4.786
                                                             jet-plume jet-cross
                                                                 2.469     17.98
                                                             plu-cross jet-strat
                                                                 953.6     3.773
                                                             plu-strat
                                                                 4.664
                                                               hor dis>=

CORMIX1 flow category algorithm is turned off.
                                                                      to   range
Help: F1.  Quit: <esc>.  Configuration:ATNO0.  FILE: EDMONDS.VAR;
UM INITIAL DILUTION CALCULATION (linear mode)
 plume dep plume dia poll conc  dilution   hor dis
         m         m                           m
     20.12   0.09919     100.0     1.000     0.000

     20.12    0.1392      70.71     1.404    0.1001
     20.12    0.1960      50.00     1.976    0.2418
     20.12    0.2762      35.36     2.784    0.4423
     20.11    0.3889      25.00     3.927    0.7256
     20.10    0.5471      17.68     5.544     1.125
     20.05    0.7675      12.50     7.831     1.686
     19.94     1.069      8.839     11.07     2.467
     19.64     1.463      6.250     15.64     3.525
     18.96     1.928      4.420     22.11     4.863
     17.70     2.439      3.125     31.26     6.369
     15.78     3.050      2.210     44.19     7.924
     13.19     3.915      1.563     62.50     9.572
     11.64     4.558      1.314     74.32     10.49 -> trap level
     9.978     5.531      1.105     88.38     11.54
     8.329     7.712     0.8975     108.8     12.97 -> begin overlap
Plumes not merged, Brooks method may be invalid.
FARFIELD CALCULATION (based on Brooks, 1960, see guide)
Farfield dispersion based on wastefield width of      187.7m
   --4/3 Power Law--    -Const Eddy Diff-
      conc  dilution      conc  dilution  distance         Time
                                              m          sec    hrs
    0.8957     109.0    0.8957     109.0     16.22      162.1    0.0
    0.8968     108.9    0.8968     108.9     24.32      567.5    0.2
    0.8969     108.9    0.8970     108.9     32.43      972.9    0.3
    0.8950     109.1    0.8959     109.0     40.54       1378    0.4
    0.8891     109.9    0.8925     109.4     48.65       1784    0.5
    0.8791     111.1    0.8864     110.2     56.76       2189    0.6
    0.8656     112.9    0.8783     111.2     64.86       2595    0.7
    0.8492     115.1    0.8686     112.5     72.97       3000    0.8
    0.8311     117.7    0.8577     114.0     81.08       3405    0.9
```

APPENDIX C— (CONT'D) — MIXING ZONE MODEL OUTPUT - CCEC

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Mar 11, 1997,  13:22:21  ERL-N PROGRAM PLUMES, Ed 3, 3/11/94  Case:   2 of   8
Title   EDMONDS OUTFALL 001 SUMMER STRATIFICATION(50%tile V=22cm/s)    linear
 tot flow   # ports port flow   spacing  effl sal effl temp   far inc   far dis
   0.1862         7   0.02660        30       0.0         20     8.108     81.08
 port dep  port dia plume dia total vel horiz vel vertl vel asp coeff print frq
    20.12    0.1270   0.09919     3.442     3.442     0.000      0.10        50
port elev ver angle cont coef  effl den poll conc     decay  Froude #  Roberts F
   0.6096        0.0      0.61  -1.73284       100         0     22.25     49.77
hor angle red space p amb den p current   far dif   far vel K:vel/cur Stratif #
       90     30.00   22.8293    0.2200    0.0003      0.22     15.65 0.0002688
    depth   current   density  salinity      temp  amb conc  N (freq) red grav.
      0.0      0.22     21.49                                  0.02526    0.2413
     33.5      0.22     23.72                                buoy flux puff-ther
                                                            0.0002140     1.811
                                                            jet-plume jet-cross
                                                                2.078     1.375
                                                            plu-cross jet-strat
                                                               0.6028     3.461
                                                            plu-strat
                                                                4.467
                                                              hor dis>=

CORMIX1 flow category algorithm is turned off.
                                                                      to   range
Help: F1.  Quit: <esc>.  Configuration:ATNO0.  FILE: EDMONDS.VAR;
UM INITIAL DILUTION CALCULATION (linear mode)
 plume dep plume dia poll conc  dilution   hor dis
         m         m                          m
     20.12   0.09919     100.0     1.000     0.000

     20.12    0.1375      70.71     1.404   0.09988
     20.12    0.1906      50.00     1.976    0.2396
     20.12    0.2626      35.36     2.784    0.4345
     20.11    0.3591      25.00     3.927    0.7057
     20.10    0.4862      17.68     5.544     1.082
     20.07    0.6502      12.50     7.831     1.605
     19.99    0.8568      8.839     11.07     2.338
     19.84     1.111      6.250     15.64     3.318
     19.61     1.417      4.420     22.11     4.430
     19.32     1.785      3.125     31.25     5.631
     18.96     2.224      2.210     44.19     6.950
     18.54     2.745      1.563     62.49     8.456
     18.06     3.363      1.105     88.36     10.25
     17.50     4.096     0.7813     125.0     12.47
     16.86     4.964     0.5524     176.7     15.37
     16.26     5.796     0.4158     234.8     18.61 -> trap level
     16.12     5.995     0.3906     249.9     19.49
     15.29     7.221     0.2762     353.4     26.96
     15.11     7.603     0.2507     389.4     32.97
 -> local maximum rise or fall
Plumes not merged, Brooks method may be invalid.
FARFIELD CALCULATION (based on Brooks, 1960, see guide)
Farfield dispersion based on wastefield width of      187.6m
   --4/3 Power Law--    -Const Eddy Diff-
      conc  dilution      conc  dilution  distance         Time
                                              m        sec    hrs
    0.2497     391.0    0.2497     391.0     40.54     34.39   0.0
    0.2499     390.6    0.2499     390.6     48.65     71.25   0.0
    0.2501     390.4    0.2501     390.4     56.76     108.1   0.0
    0.2502     390.3    0.2502     390.3     64.86     145.0   0.0
```

APPENDIX D--RESPONSE TO COMMENTS

The following is a discussion of the comments received on the draft permit during the public comment period, and the actions which were taken in response to the comments.

Formal Comments Received from Permittee

1. *Comment:* The City requests the Department to clarify the "Summary of Permit Report Submittals" on page 4 to agree with the wording on page 15 of the Fact Sheet. The City requests that an annual report that lists the "status of industrial users in the POTW's service area" be provided to the Department by the City. The City requests that an "industrial user survey" not be required, per page 15 of the Fact Sheet, in which it states "…this permit does not require execution of an Industrial User Survey… ". The City requests that Section S6.D be modified to be in agreement with the Fact Sheet.

   Response to Comment 1: Since no industrial users discharge into the Edmond's system, annual Industrial User Surveys will not be required. The intention was as stated in the Fact Sheet, therefore the permit text was changed accordingly.

2. *Comment:* The City requests the Department to change the wording in sections S8.D6. and S9.B6 to read that the effluent samples shall be collected just after dechlorination, rather than the proposed wording of prior to chlorination. The configuration of the Edmonds facility makes it impossible to obtain a sample prior to chlorination, and collecting a sample of the finished product entering the Sound is more representative than collecting a sample before a known toxin (chlorine) is added.

   Response to Comment 2: Comment noted and text changed as follows: The whole effluent toxicity tests shall be run on an unmodified sample of final effluent.

3. *Comment:* The City requests the Department to change the wording in the second paragraph of Section S.12 to read "Preferably this evaluation will be performed after the outfall repair tentatively scheduled for summer 2004." I believe that the word "repair" is more accurate than "modification".

   Response to Comment 3: Comment noted and text changed accordingly.

4. *Comment 4:* There are two inaccurate references in the "Description of the Facility" section on page 1 of the Fact Sheet. Please note the correct agency name is Olympic View Water and Sewer District; and the Shoreline Wastewater Management District has changed their name to the Ronald Wastewater District.

   Response to Comment 4: Comment noted and text changed accordingly.

Formal Comments Received from Department of Health – Frank Meriwether

1. *Comment:* Permit Section S2.A. The Monitoring Schedule lists the minimum sampling frequency (influent and effluent) for CBOD, TSS and fecal coliform as three times weekly, and one time weekly for influent BOD. However, according to my copy of the Permit Writers Manual the minimum sampling frequency for activated sludge plants with an Average Design Flow greater than 5.0 mgd is five times weekly for BOD and TSS (influent and effluent), and seven times weekly for fecal coliform. Since the Edmonds WWTP has maximum month design flow of 11.8 mgd I believe that these increased test frequencies are applicable to this WWTP. In particular, the DOH Shellfish Program encourages frequent testing for fecal coliforms in WWTPs discharging to marine waters.

   Response to Comment 1: The following text has been added to the *Monitoring Requirements* section on page 12 of the Fact Sheet:

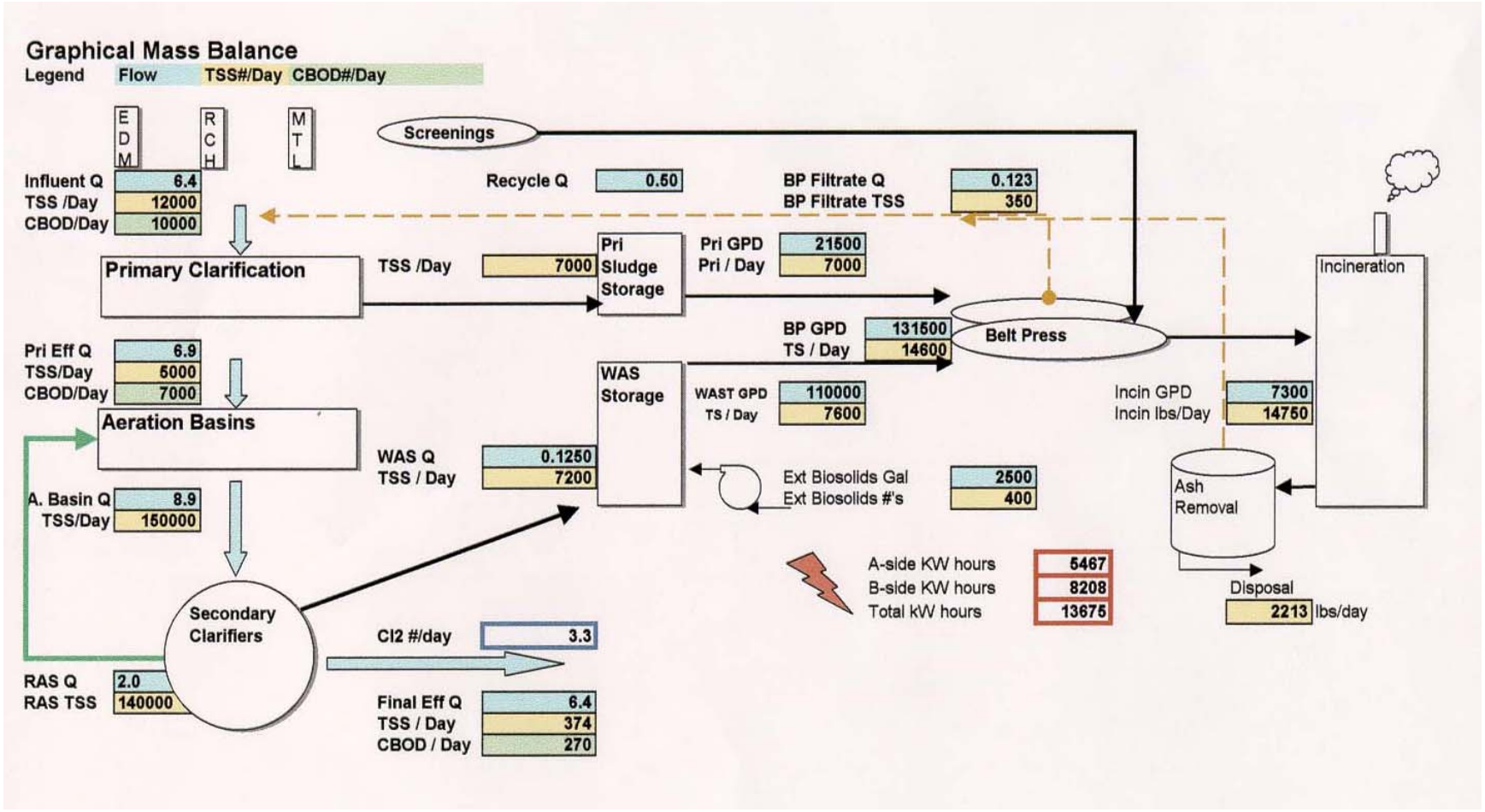
   > *Monitoring frequencies for TSS, CBOD, and fecal coliform are consistent with the previous permit, but are less than those recommended for activated sludge facilities with design flows greater than 5.0 MGD. The decision to keep the reduced monitoring schedule is warranted by the facility's excellent compliance record over the previous permit cycle with this same schedule. Edmonds, on average, operates at 19 and 17% of the permit requirements for TSS and CBOD, respectively (percentages represent [Long Term Average, mg/L]/ [Average Monthly Limit, mg/L]). For fecal coliform the ratio of LTA to AML is 24%. The relatively low coefficients of variance (COV) for TSS and CBOD, 58 and 27% respectively, also support a reduced monitoring schedule. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's Permit Writer's Manual (July 2002).*

2. *Comment:* Permit Section S3.G. The DOH Shellfish Program has an emergency beeper with the (360)786-4183, which is the same number that is listed in the draft permit. However we request that Ecology list our main office number (360)236-3330 for this notification requirement. This number is manned during normal working hours, and contains a message during nonwork hours for callers to dial the emergency beeper number in case that sewage spills and WWTP bypasses are being reported to us. We believe that a single DOH phone number, that is the (360)236-3330 number, will be easier for permittees to note and to call. Therefore we request the (360)236-3330 number be listed in the permit and in Ecology's boilerplate language.

   Response to Comment 2: Comment noted and text changed accordingly.

This concludes the summary of comments received during the public comment period.

APPENDIX E—LAYOUT DIAGRAM OF EDMONDS WWTP



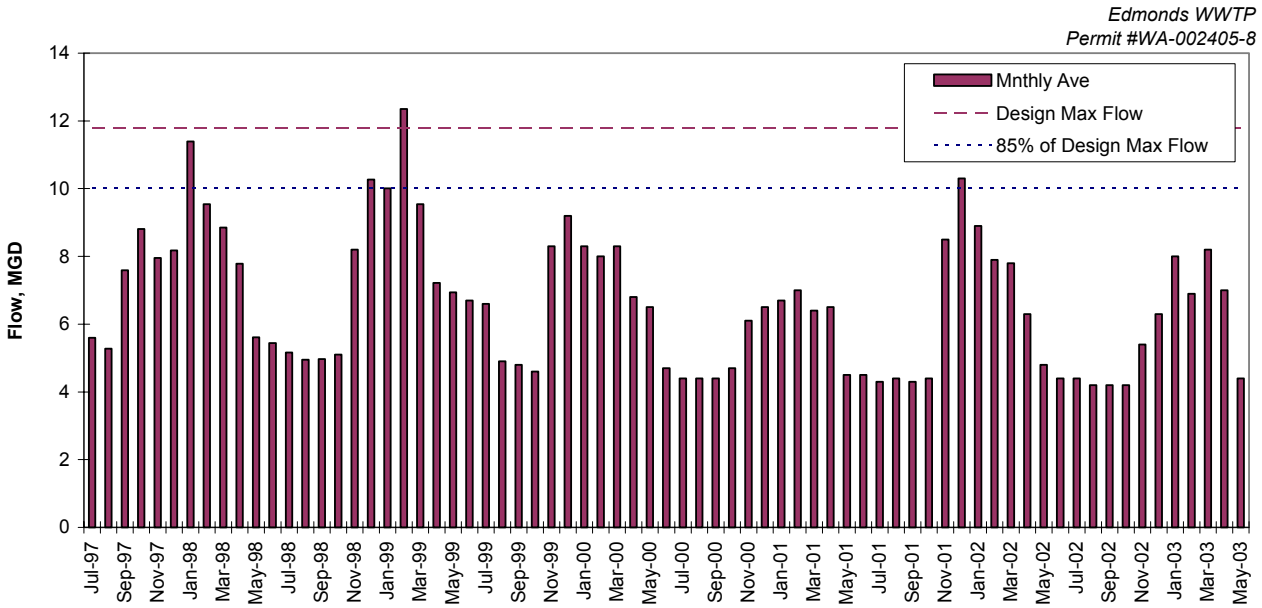
APPENDIX F — DISCHARGE MONITORING DATA. 1997 - 2003

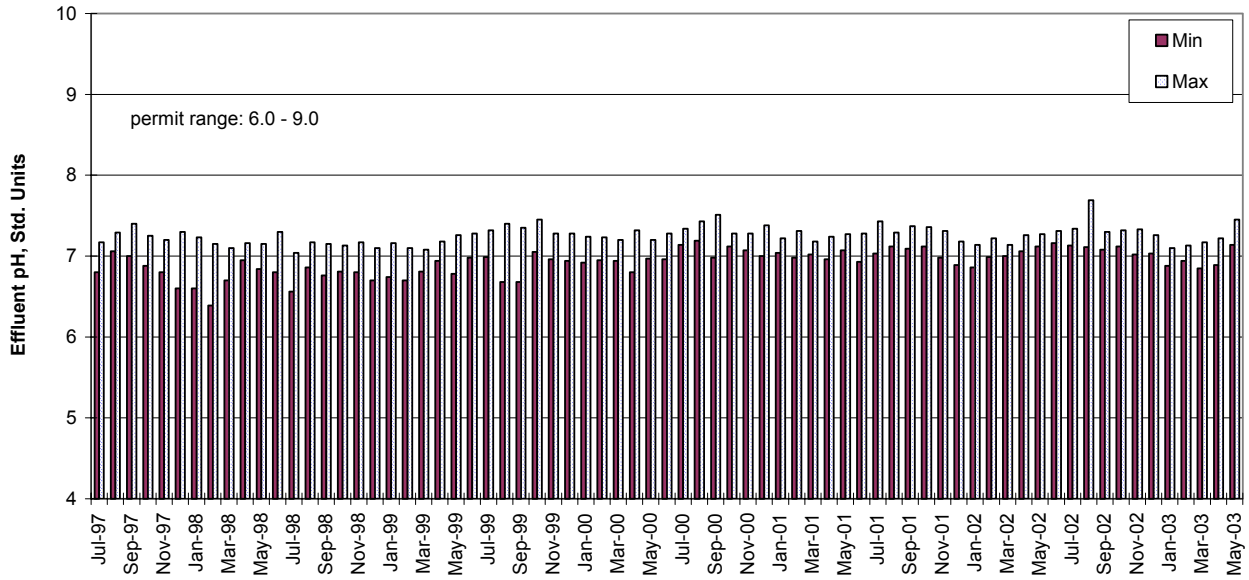
Facility: Edmonds WWTP
Permit No: WA-002405-8

	Influent														Effluent																	
	Flow, MGD	Flow, MGD	BOD, mg/L	BOD, mg/L	BOD, ppd	BOD, ppd	CBOD, mg/L	CBOD, mg/L	CBOD, ppd	CBOD, ppd	TSS, mg/L	TSS, mg/L	TSS, ppd	TSS, ppd	CBOD, mg/L	CBOD, mg/L	CBOD, ppd	CBOD, ppd	CBOD, % Removal	TSS, mg/L	TSS, mg/L	TSS, ppd	TSS, ppd	TSS, % Removal	PH	PH	Fecal Coliform, #/100 ml	Fecal Coliform, #/100 ml	Chlorine, µg/L	Chlorine, µg/L	Chlorine, ppd
Date	Mnthly Ave	Mnthly Max	Mnthly Ave	Wkly Ave	Mnthly Ave	Wkly Ave	Mnthly Ave	Wkly Ave	Mnthly Ave	Wkly Ave	Mnthly Ave	Wkly Ave	Mnthly Ave	Wkly Ave	Mnthly Ave	Wkly Ave	Mnthly Ave	Wkly Ave	Ave	Mnthly Ave	Wkly Ave	Mnthly Ave	Wkly Ave	Ave	Min	Max	GEM	GM7	Ave	Max	Ave
1-Jul-97	5.60	6.60	200	219	9,335	10,303					210	238	9,809	11,599						6.3	9	294	406	97	6.8	7.2	67	189	62	310	2.90
1-Aug-97	5.28	5.50	194	234	8,527	10,343					229	250	10,063	10,842						7	7	313	327	97	7.1	7.3	21	35	26	250	1.10
1-Sep-97	7.59	8.90	231	305	14,605	17,297					242	270	15,286	17,564						7	8	462	542	97	7.0	7.4	23	32	56	240	3.60
1-Oct-97	8.81	11.60	198	259	14,578	18,290					203	264	14,921	18,034						10	13	756	892	95	6.9	7.3	49	330	73	330	5.60
1-Nov-97	7.95	10.10	192	242	12,727	15,879					202	284	13,376	18,238						12	14	763	900	94	6.8	7.2	35	355	109	440	7.70
1-Dec-97	8.18	11.00	205	272	13,994	16,560					203	292	13,866	17,778						7	9	464	627	97	6.6	7.3	21	255	68	380	4.80
1-Jan-98	11.39	16.30	144	186	13,710	17,379					151	208	14,392	21,409						5	6	479	506	97	6.6	7.2	62	146	103	430	10.00
1-Feb-98	9.54	11.57	168	199	13,396	16,099					166	228	13,197	17,304						7	7	527	613	96	6.4	7.2	38	159	60	230	4.70
1-Mar-98	8.85	10.70	178	196	13,138	16,346					198	234	14,589	18,682						5	6	397	475	97	6.7	7.1	3	4	52	290	3.80
1-Apr-98	7.78	8.50	217	284	14,102	17,290					236	312	15,330	20,296						7	7	443	444	97	7.0	7.2	10	17	56	340	3.70
1-May-98	5.61	7.50	226	256	10,569	13,323					229	276	10,733	12,760						5	7	253	293	98	6.8	7.2	58	322	84	370	4
1-Jun-98	5.44	5.80	226	250	10,238	11,468					237	276	10,767	11,970						7	12	322	468	97	6.8	7.3	42	53	32	340	1.50
1-Jul-98	5.16	5.50	223	260	9,607	11,276					233	266	10,002	11,362						8	9	330	399	97	6.6	7.0	8	75	45	240	1.90
1-Aug-98	4.95	5.60	229	283	9,474	11,565					229	254	9,474	10,380						6	7	253	283	97	6.9	7.2	7	17	109	430	4.40
1-Sep-98	4.97	5.40	288	563	11,938	22,538					295	612	12,214	24,500						7	7	270	300	98	6.8	7.2	12	58	49	350	2.00
1-Oct-98	5.10	6.00	204	278	8,659	12,056					218	250	9,287	10,463						8	11	332	490	96	6.8	7.1	13	42	24	320	1.00
1-Nov-98	8.20	15.80	210.7	339	14,405	24,880	183	339	12,479	24,880	269	554	18,383	40,659	7	8	460	570	96	6	7	528	428	98	6.8	7.2	11	48	90	390	6.40
1-Dec-98	10.27	17.70	165	238	14,129	16,475	150	222	12,844	15,367	183	224	15,644	19,616	5	6	407	447	97	6	8	587	486	97	6.7	7.1	38	305	72	280	6.10
1-Jan-99	10.01	14.80	162	205	13,497	18,431	147	195	12,280	13,661	172	238	14,318	16,263	6	8	831	778	93	7	8	682	582	96	6.7	7.2	9	53	66	260	5.30
1-Feb-99	12.35	20.40	115	179	11,853	16,421	99	132	10,213	15,285	106	144	10,952	15,409	5	6	743	629	93	6	7	746	571	95	6.7	7.1	22	91	130	300	13.70
1-Mar-99	9.54	13.10	158	209	11,786	16,678	124	169	9,245	13,309	160	226	12,259	16,004	4	5	322	359	96	8	10	636	775	95	6.8	7.1	53	326	130	450	10.50
1-Apr-99	7.22	8.10	138	227	8,291	13,252	165	284	9,942	16,580	180	254	10,838	14,405	4	5	227	292	97	6	7	418	371	98	6.9	7.2	16	106	55	340	3.40
1-May-99	6.94	7.50	195	278	11,263	16,461	185	209	10,694	11,902	224	264	12,946	15,853	4	6	247	331	98	7	8	443	394	97	6.8	7.3	13	24	49	280	2.80
1-Jun-99	6.70	8.50	199	265	11,164	15,029	196	225	11,014	12,760	215	294	12,071	18,880	4	8	209	256	98	6	6	372	313	97	7.0	7.3	10	25	53	280	3.00
1-Jul-99	6.60	7.50	196	245	10,693	13,486	164	231	8,963	12,335	235	316	12,837	16,867	4	5	225	270	98	6	8	352	421	97	7.0	7.3	12	16	110	320	6.20
1-Aug-99	4.90	6.50	203	295	8,036	11,064	191	226	7,582	8,482	242	296	9,666	11,850	5	9	188	346	97	5	7	287	221	98	6.7	7.4	40	319	41	320	1.70
1-Sep-99	4.80	6.20	185	223	7,856	10,993	199	244	8,357	11,262	240	288	10,108	14,478	5	6	224	300	97	6	6	292	252	97	6.7	7.4	27	84	24	320	0.90
1-Oct-99	4.60	6.20	187	226	7,607	11,696	226	413	8,707	13,788	250	340	9,753	12,307	4	5	169	193	98	6	7	296	236	97	7.1	7.5	8	14	64	300	2.50
1-Nov-99	8.30	13.00	119	130	7,633	8,005	136	207	8,290	11,352	204	334	13,233	21,519	4	5	272	412	97	6	6	384	450	96	7.0	7.3	6	27	47	170	3.00
1-Dec-99	9.20	13.00	165	239	13,372	17,903	148	176	11,467	14,550	172	240	13,336	18,348	4	6	331	493	97	5	6	498	407	97	6.9	7.3	59	276	32	80	2.40
1-Jan-00	8.30	11.00	155	173	10,399	12,275	145	191	9,836	13,069	186	244	12,344	15,466	6	8	389	543	96	9	12	748	634	95	6.9	7.2	11	22	29	160	2.00
1-Feb-00	8.00	9.70	167	196	10,921	12,568	149	181	10,046	11,171	182	224	12,179	14,759	6	7	427	488	96	12	14	829	882	93	7.0	7.2	46	91	20	50	1.40
1-Mar-00	8.30	11.20	180	204	12,304	13,107	152	190	10,601	13,900	178	248	12,240	14,892	7	8	470	588	96	8	10	816	562	95	6.9	7.2	83	480	60	380	4.00
1-Apr-00	6.80	7.90	169	199	956	11,142	164	1,967	9,235	120,054	204	302	11,439		7	10	383	506	96	7	8	402	460	97	6.8	7.3	16	41	106	360	5.90
1-May-00	6.50	6.90	202	213	11,025	12,017	171	195	9,219	11,216	260	402	14,041	21,457	5	6	247	333	97	7	8	450	351	98	7.0	7.2	22	59	95	320	5.10
1-Jun-00	4.70	5.90	202	224	7,573	8,402	172	224	6,553	9,134	228	262	8,717	10,809	6	11	227	374	97	8	10	412	315	96	7.0	7.3	24	31	39	110	1.50
1-Jul-00	4.40	4.60	192	224	6,939	8,213	194	246	6,988	8,580	241	306	8,699	10,974	6	7	203	238	97	6	7	267	217	97	7.1	7.3	9	18	51	240	1.90
1-Aug-00	4.40	5.60	207	237	7,316	8,697	190	248	6,996	9,626	256	330	9,496	14,852	7	13	253	479	97	9	11	314	383	97	7.2	7.4	22	105	70	250	2.60
1-Sep-00	4.40	5.20	219	235	7,598	8,638	193	241	6,941	9,640	277	340	10,106	13,531	5	7	183	247	97	7	8	255	287	98	7.0	7.5	7	12	38	140	1.40
1-Oct-00	4.70	5.80	230	245	9,103	10,050	202	250	7,569	10,050	264	374	9,902	14,036	5	5	189	212	98	8	10	412	308	98	7.1	7.3	13	53	51	140	2.00
1-Nov-00	6.10	8.10	236	292	12,652	19,712	220	272	11,096	13,934	264	362	13,408	19,591	6	7	318	345	97	9	9	484	445	97	7.1	7.3	5	13	48	160	2.50
1-Dec-00	6.50	8.80	231	311	12,369	16,865	212	274	11,213	15,361	249	318	13,083	17,769	6	7	329	377	97	7	7	392	378	97	7.0	7.4	22	89	66	200	3.60
1-Jan-01	6.70	7.90	224	236	12,973	14,135	198	251	10,998	13,997	232	308	12,833	17,210	4	5	237	291	98	6	8	484	351	97	7.0	7.2	37	356	37	140	2.10
1-Feb-01	7.00	8.70	238	250	13,138	13,638	203	245	11,303	14,886	243	304	13,576	16,226	4	5	232	272	98	6	8	461	351	98	7.0	7.3	6	19	47	290	2.70
1-Mar-01	6.40	7.10	231	251	12,266	13,840	215	242	11,409	13,602	266	320	14,103	18,148	4	5	195	242	98	5	8	294	414	98	7.0	7.2	12	22	34	180	1.80
1-Apr-01	6.50	7.90	245	250	12,647	13,136	194	228	10,448	12,110	252	392	13,527	20,597	4	5	233	248	98	6	7	347	413	98	7.0	7.2	20	36	44	100	2.30
1-May-01	4.50	5.90	244	250	8,967	9,639	211	261	8,142	11,358	273	350	10,502	15,092	6	10	251	421	97	8	9	386	299	97	7.1	7.3	4	9	62	280	2.40
1-Jun-01	4.50	6.10	226	262	7,251	8,294	206	328	8,186	166,661	271	444	10,589	22,588	5	9	205	434	97	8	11	493	309	97	6.9	7.3	12	17	91	340	3.70
1-Jul-01	4.30	5.30	233	249	8,062	8,303	199	237	7,102	8,643	286	400	1,027	14,678	4	5	154	170	98	6	8	287	222	98	7.0	7.4	18	21	56	170	2.00
1-Aug-01	4.40	6.30	210	280	7,223	9,341	216	272	7,982	9,642	273	378	10,173	14,502	5	6	187	238	98	6	6	216	234	98	7.1	7.3	24	93	68	190	2.50
1-Sep-01	4.30	4.80	265	286	9,045	9,780	234	281	8,204	9,557	299	368	10,460	12,583	5	6	181	190	98	7	8	270	234	98	7.1	7.4	31	75	67	200	2.40
1-Oct-01	4.40	6.00	256	293	8,797	10,005	226	272	8,188	11,814	259	314	9,373	14,762	5	5	171	192	98	6	8	276	231	98	7.1	7.4	19	48	73	210	2.70
1-Nov-01	8.50	14.20	184	274	11,710	12,774	146	249	9,916	11,625	206	322	14,107	21,564	6	8	452	625	95	8	10	589	756	94	7.0	7.3	12	16	60	210	3.90
1-Dec-01	10.30	16.70	155	244	12,812	15,669	150	224	12,296	14,732	160	228	13,036	16,955	4	5	364	496	97	7	8	805	611	95	6.9	7.2	6	16	56	220	4.60
1-Jan-02	8.90	14.80	167	192	11,671	13,247	141	165	9,966	14,022	168	280	11,857	15,879	4	5	277	371	97	6	7	519	447	96	6.9	7.1	17	118	45	260	3.40
1-Feb-02	7.90	11.30	180	199	9,726	10,804	140	177	8,434	11,194	171	198	10,400	14,367	4	4	214	232	97	5	6	356	433	96	7.0	7.2	3	6	35	160	2.30
1-Mar-02	7.80	9.50	189	211	12,101	12,582	153	230	9,885	11,965	181	230	11,706	14,962	5	7	298	417	97	6	8	466	381	97	7.0	7.1	8	20	41	100	2.70
1-Apr-02	6.30	8.00	222	277	11,315	15,253	203	235	10,440	13,109	233	332	12,044	18,275	8	8	389	497	96	8	13	431	539	97	7.1	7.3	5	12	78	330	4.00
1-May-02	4.80	6.10	258	321	11,072	16,326	238	279	10,033	14,179	263	372	11,149	18,925	8	11	324	413	97	8	10	454	325	97	7.1	7.3	42	58	75	350	3.00
1-Jun-02	4.40	5.10	263	298	9,249	10,935	225	289	8,174	11,313	279	314	10,139	12,343	4	6	140	231	98	6	7	271	226	98	7.2	7.3	40	65	82	310	3.00
1-Jul-02	4.40	5.60	254	320	8,902	12,269	241	296	8,713	11,418	267	300	9,629	11,509	5	6	167	214	98	6	8	251	235	97	7.1	7.3	82	208	51	240	2.00
1-Aug-02	4.20	5.30	261	281	8,957	9,843	223	241	7,713	8,609	276	336	9,566	11,851	8	9	287	331	96	10	14	460	334	95	7.1	7.7	43	94	129	490	4.50
1-Sep-02	4.20	4.90	277	295	9,781	12,035	243	271	8,591	10,597	291	370	10,314	15,120	6	7	210	252	98	8	9	313	269	97	7.1	7.3	28	37	117	390	4.10
1-Oct-02	4.20	5.30	274	328	9,291	12,295	246	276	8,387	10,110	294	400	10,036	15,012	6	7	206	263	98	7	8	231	297	98	7.1	7.3	33	203	91	330	3.20
1-Nov-02	5.40	6.10	265	291	12,018	12,951	256	300	11,814	15,059	286	346	13,174	17,025	5	7	232	330	98	8	11	368	511	98	7.0	7.3	5	19	51	300	2.30
1-Dec-02	6.30	7.50	271	298	14,210	15,383	229	297	12,246	14,614	274	368	14,419	18,108	5	5	245	288	98	7	8	424	354	97	7.0	7.3	5	12	116	340	6.10
1-Jan-03	8.00	12.20	223	245	13,835	14,916	164	212	11,068	13,621	225	340	15,528	28,082	5	6	339	408	97	7	8	653	501	97	6.9	7.1	2	4	54	210	3.60
1-Feb-03	6.90	8.10	241	258	13,207	15,080	198	232	11,026	13,550	220	270	12,333	16,889	6	7	325	372	97	7	9	423	496	96	6.9	7.1	11	15	129	360	7.60
1-Mar-03	8.20	14.70	187	260	13,190	13,871	182	244	11,284	14,199	193	258	12,100	14,887	5	6	365	547	97	7	7	444	563	96	6.9	7.2	65	135	71	290	4.80
1-Apr-03	7.00	8.10	219	264	12,721	15,436	193	220	11,122	12,935	214	294	12,419	17,164	7	8	384	408	97	8	8	441	459	97	6.9	7.2	49	117	83	450	4.90
1-May-03	4.40	5.80	232	241	8,240	9,246	198	233	6,748	8,317	268	482	9,607	23,315	7	9	222	299	96	8	10	335	302	96	7.1	7.5	34	288	45	130	1.70
AVE:	6.62	8.74	209	254	10,756	13,401	188	273	9,603	17,249	229	308	11,817	16,606	5	7	290	365	97	7	8.5	433	425	97	6.9	7.3	25	98	65	274	3.67
MIN:	4.20	4.60	115	130	956	8,005	99	132	6,553	8,317	106	144	1,027	10,380	4	4	140	170	93	5	6	216	217	93	6.4	7.0	2	4	20	50	0.90
MAX:	12.35	20.40	288	563	14,605	24,880	256	1,967	12,844	166,661	299	612	18,383	40,659	8	13	831	778	98	12	14	829	900	98	7.2	7.7	83	480	130	490	13.70
LIMIT:	10.03				16,320								17,000		25	40	2460	3936	85	30	45	2952	4430	85	6.0	9.0	200	400	228	598	22
DESIGN:	11.80				19,200								20,000																		

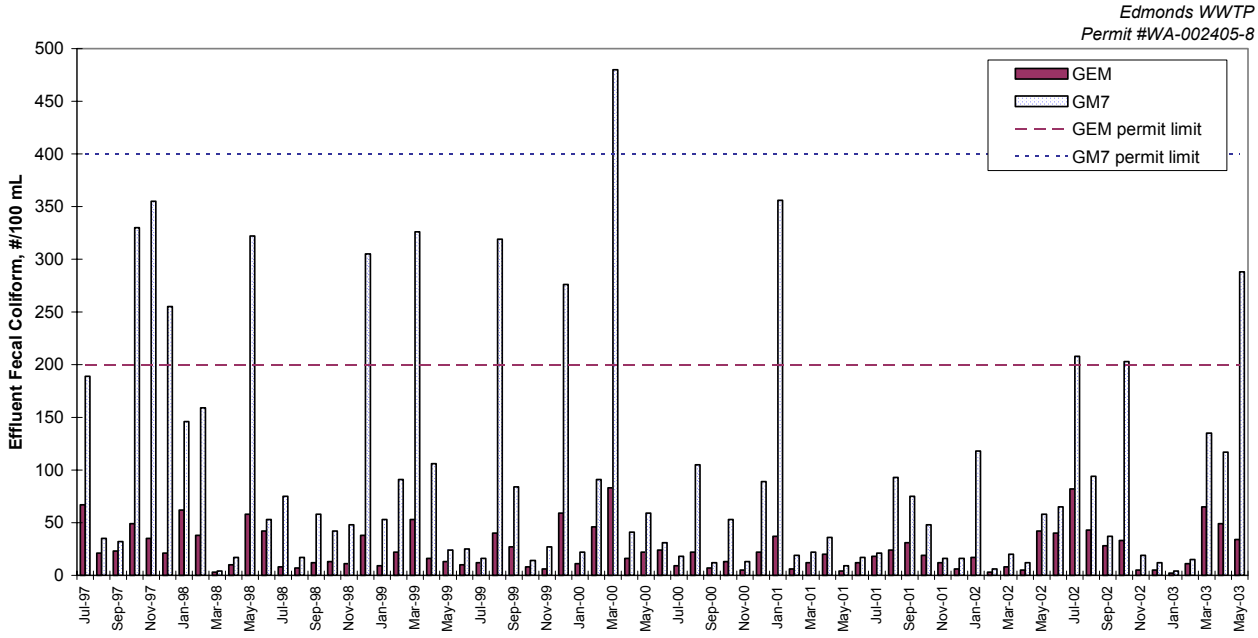
exceeds permit limits

APPENDIX F (CONT'D). DISCHARGE MONITORING DATA, FLOW AND EFFLUENT PH, 1997 - 2003

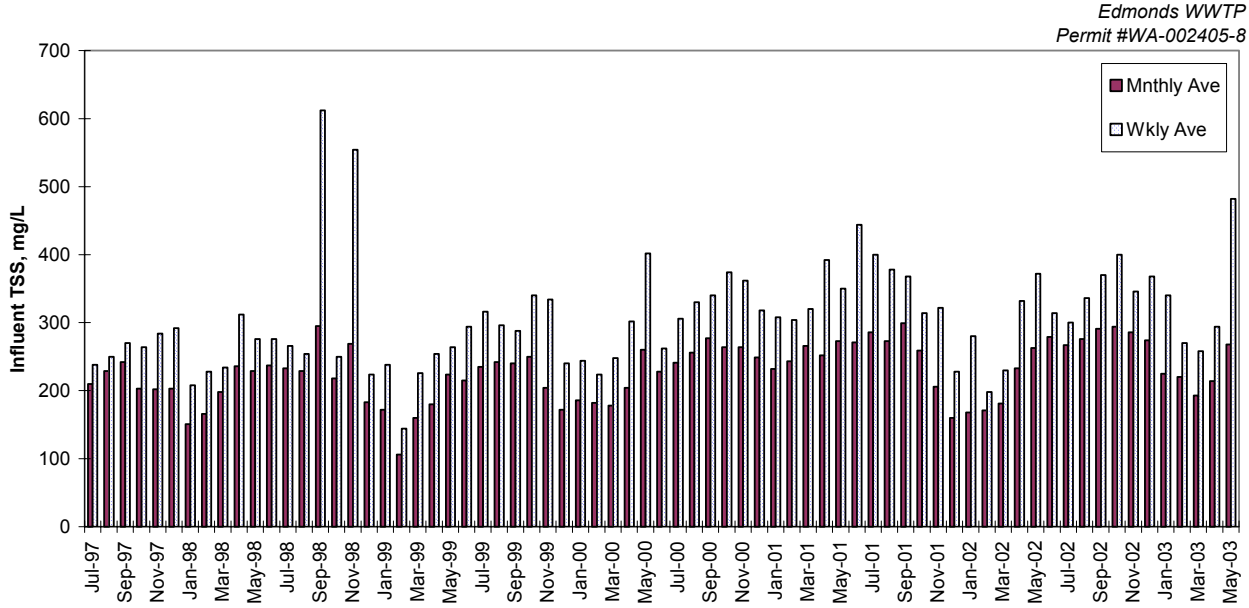


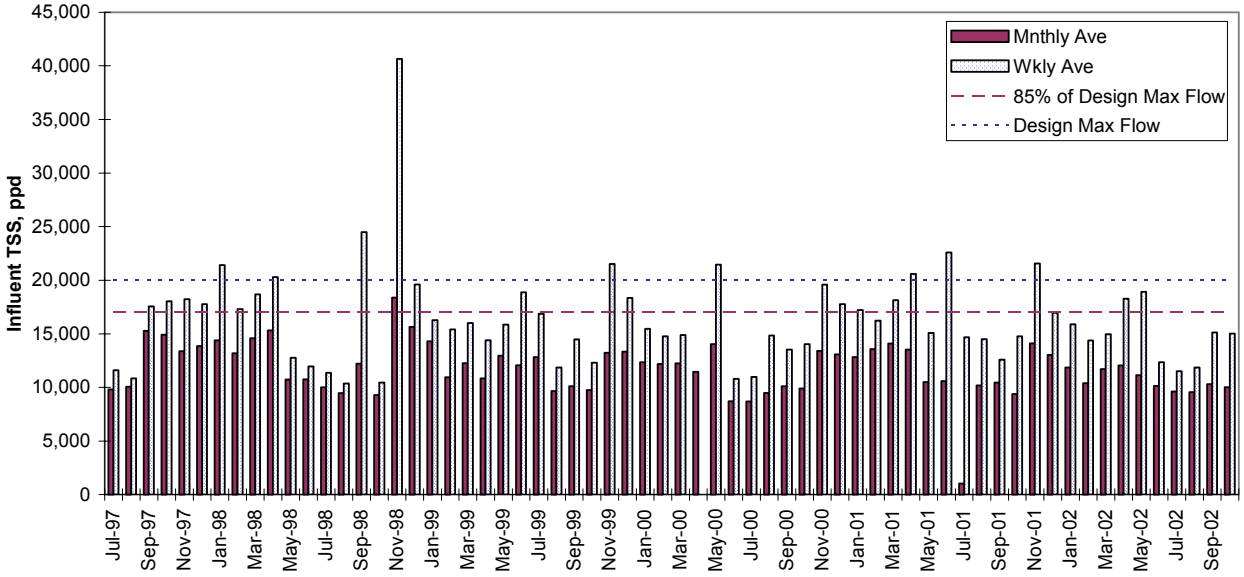


APPENDIX F (CONT'D). DISCHARGE MONITORING DATA, EFF. FECAL COLIFORM, 1997 - 2003

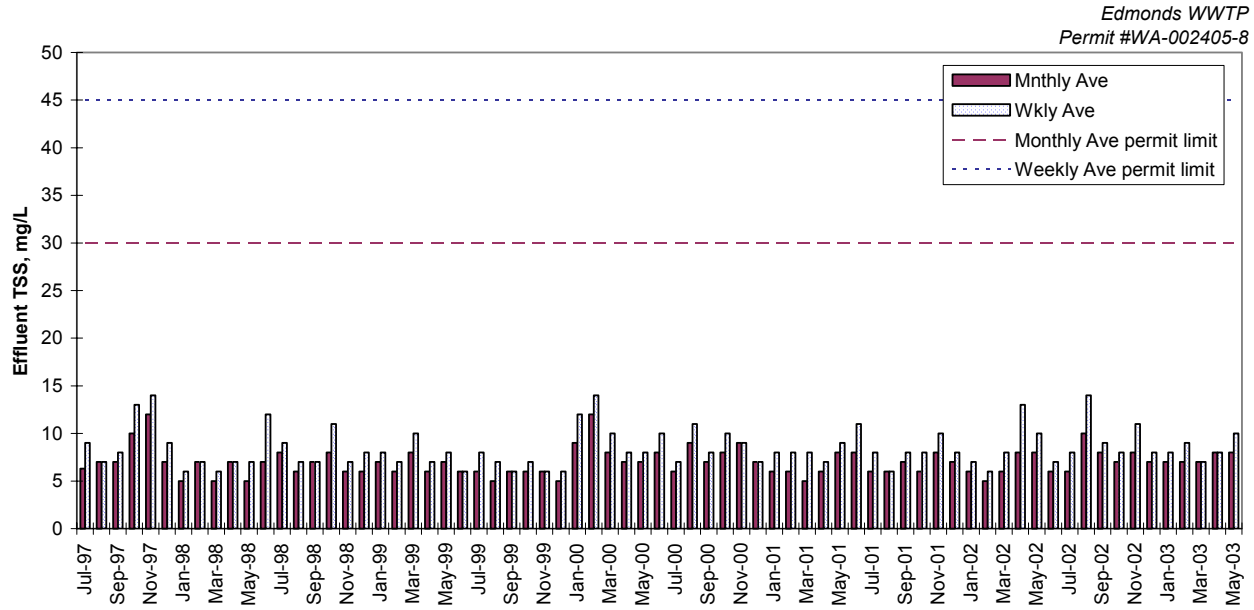


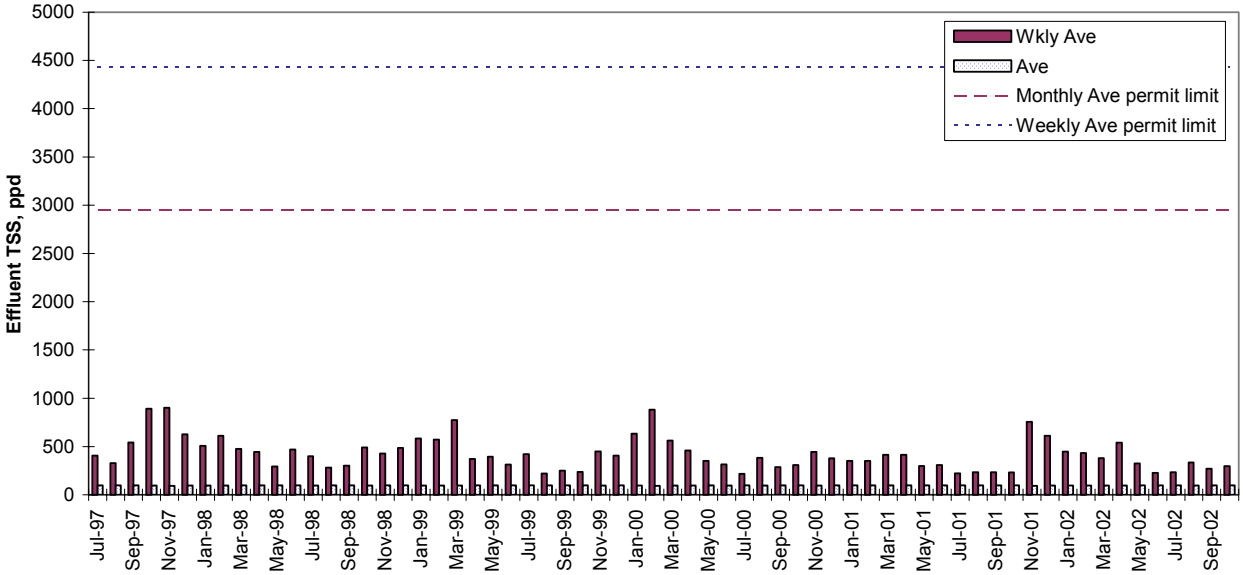
APPENDIX F (CONT'D). DISCHARGE MONITORING DATA, INFLUENT TSS, 1997 – 2003



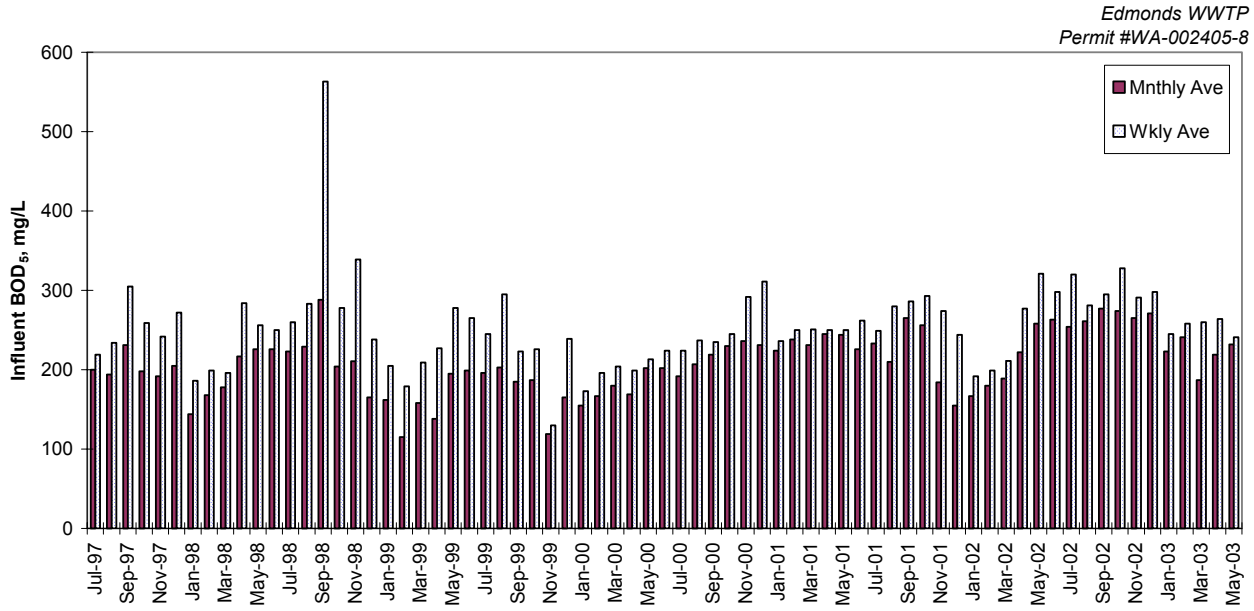


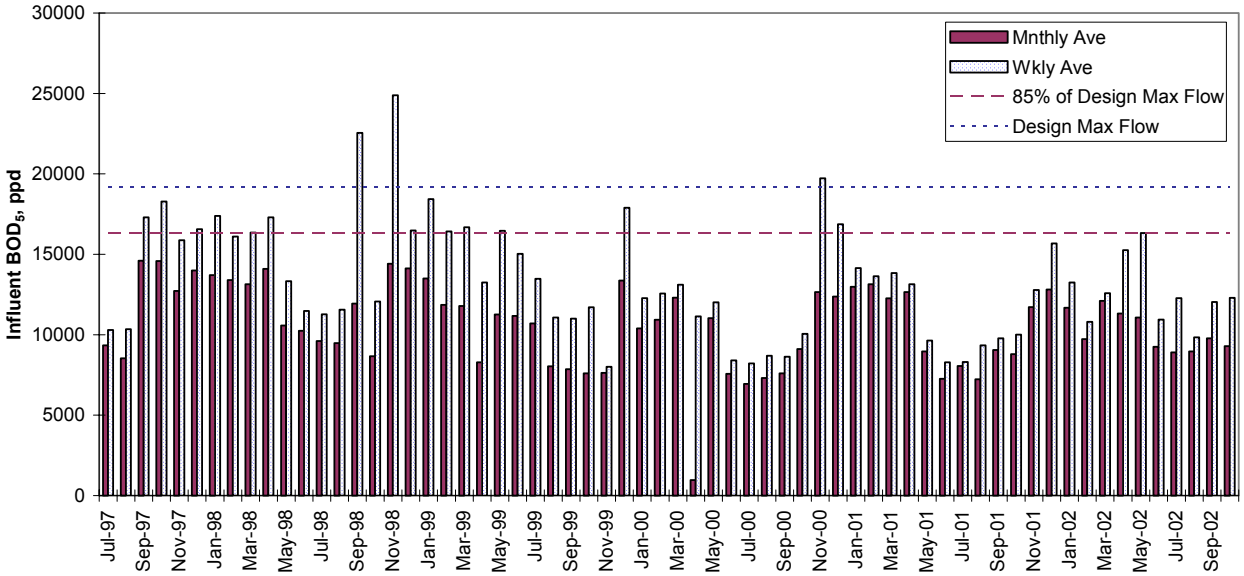
APPENDIX F (CONT'D). DISCHARGE MONITORING DATA, EFFLUENT TSS, 1997 - 2003



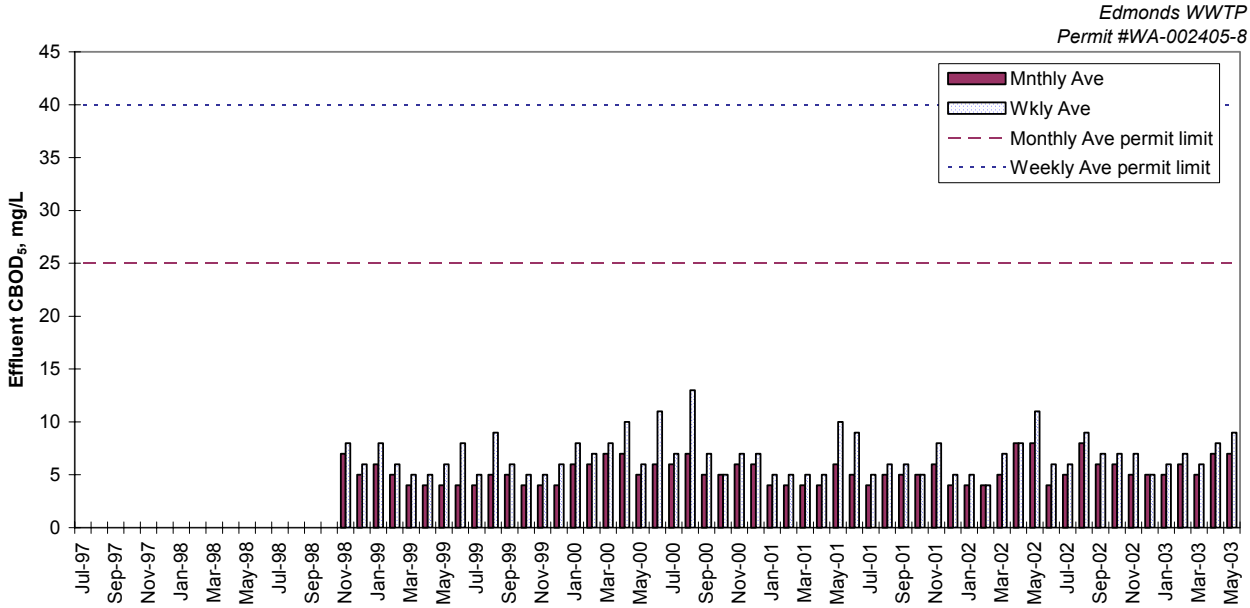


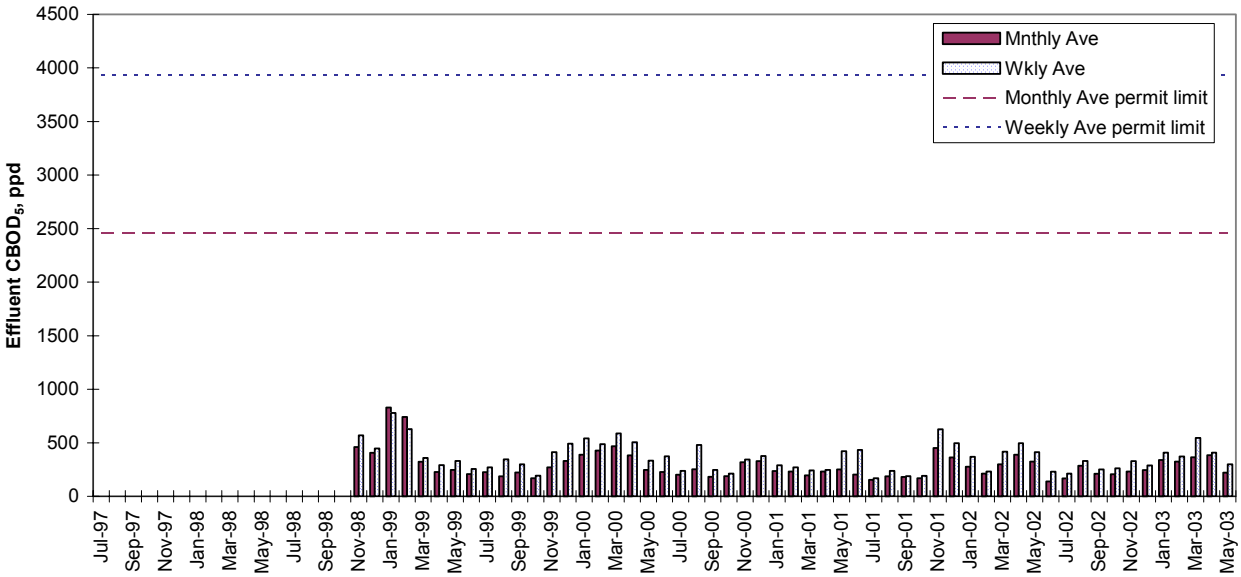
APPENDIX F (CONT'D). DISCHARGE MONITORING DATA, INFLUENT BOD_5, 1997 - 2003





APPENDIX F (CONT'D). DISCHARGE MONITORING DATA, EFFLUENT $CBOD_5$, 1997 - 2003





APPENDIX G - SUMMARY OF PRIORITY POLLUTANTS, 1997-2001

Facility: City of Edmonds WWTP
Permit No: WA-002405-8
Run Date: 7/14/2003

Parameter	Do Criteria Exist?			Max. Conc. Reported	Number of Samples	Number of Samples	Avg. Conc. not including BDL[1]
	Human Health	Aquatic Life	Sediment	ug/L	Taken	BDL[1]	Samples, ug/L
Bis (2-ethylhexyl) phthalate	yes	yes	yes	5.3	7	3	2.35
Chlorine[2]	no	yes	no	490	365	0	65.0
Chloroform	yes	no	no	5.7	7	1	3.92
Copper	no	yes	yes	19	7	0	16
Cyanide, weak acid diss.	no	yes	no	5	1	0	5
Cyanide, total	yes	no	no	4	7	6	4
Gamma-BHC (lindane)	yes	yes	no	0.03	7	6	0.03
Phenol	yes	yes	yes	2.50	7	6	2.50
Zinc	no	yes	yes	45	7	0	35.6

[1] BDL = Below Detection Limits

[2] data obtained from DMRs

Priority pollutants for which there are neither human health nor aquatic life criteria will not be considered further. This listing contains only those priority pollutants which were actually detected.

fn: TSDCalc10.cls

APPENDIX H - SELECT WATER QUALITY CRITERIA

Facility: City of Edmonds WWTP
Permit No: WA-002405-8
Run Date: 7/14/2003

WATER QUALITY CRITERIA (in ug/L unless otherwise noted)

Pollutant, CAS No. & Application Ref. No.	Priority Pollutant?	Carcinogen?	Water Quality Criteria				Human Health Criteria		Organoleptic Effects	Source and Comments	Metals Translators			
			Fresh		Marine		Fresh	Marine			Fresh		Marine	
			acute	chronic	acute	chronic					Acute	Chronic	Acute	Chronic
AMMONIA unionized -see seperate spreadsheets fc	N	N			8,660	1,301				WAC 173-201A				
BHC - GAMMA 58899 4P (Lindane)	N	Y	2	0.08	0.16		0.0190	0.063		173-201A, NTR - HH				
BIS(2-ETHYLHEXYL) PHTHALATE 117817 13B	Y	Y	940	3	2944	3.40	1.8	5.9		Gold Book, NTR				
CHLORINE 7782505	N	N	19	11	13	7.50				WAC 173-201A				
CHLOROFORM 67663 11V	Y	Y	28,900	1240			5.70	470		Gold Book, NTR - HH				
COPPER - 744058 6M Hardness dependent	Y	N	12.16	8.37	4.80	3.10			1000	WAC 173-201A	1.000	1.000	0.83	0.83
CYANIDE 57125 14M - Weak Acid Dissociable	Y	N	22	5.20	1.00	1.00				WAC 173-201A, NTR				
CYANIDE 57125 14M - Total	Y	N					700	220,000		WAC 173-201A, NTR				
PHENOL 108952 10A	Y	N	10,200	2,560	5,800		21,000	4,600,000	300	Gold Book, NTR - HH				
ZINC- 7440666 13M hardness dependent	Y	N	84.60	77.25	90.00	81.00			5000	WAC 173-201A,	1.000	1.000	0.946	0.946

fn: TSDCalc10.cls

APPENDIX I - AMMONIA CALCULATION SPREADSHEET

Calculation of seawater fraction of un-ionized ammonia
from Hampson (1977). Un-ionized ammonia criteria for
salt water are from EPA 440/5-88-004. Revised 19-Oct-93.

Facility: City of Edmonds WWTP
Permit No: WA-002405-8
Run Date: 7/14/2003

INPUT - receiving water information	
1. Temperature (deg C):	14.5
2. pH:	8.0
3. Salinity (g/Kg):	25.4
OUTPUT	
1. Pressure (atm; EPA criteria assumes 1 atm):	1.0
2. Molal Ionic Strength (not valid if >0.85):	0.519
3. pKa8 at 25 deg C (Whitfield model "B"):	9.305
4. Percent of Total Ammonia Present as Unionized:	2.212%
5. Unionized ammonia criteria (mg un-ionized NH3 per liter) from EPA 440/5-88-004	
Acute:	0.23
Chronic:	0.04
6. Total Ammonia Criteria (mg/L as NH3)	
Acute:	10.54
Chronic:	1.58
7. Total Ammonia Criteria (mg/L as NH3-N)	
Acute:	8.66
Chronic:	1.30

fn: TSDCalc10.cls

APPENDIX J - REASONABLE POTENTIAL CALCULATION FOR AQUATIC LIFE

Facility: City of Edmonds WWTP
Permit No: WA-002405-8
Run Date: 7/14/2003

Parameter	Metal Criteria Translator as decimal Acute	Metal Criteria Translator as decimal Chronic	Ambient Conc. (metals as dissolved) *ug/L*	State Water Quality Acute *ug/L*	State Water Quality Chronic *ug/L*	Max concentration at edge of... Acute Mixing Zone *ug/L*	Max concentration at edge of... Chronic Mixing Zone *ug/L*	**LIMIT REQ'D?**	Effluent percentile value	*Pn*	Max effluent conc. measured (metals as total recoverable) *ug/L*	Coeff Variation *CV*	*s*	# of Samples *n*	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor
AMMONIA unionized -see seperate spreadsheets for FW criteria				8,660	1,301	1032	122	**NO**	0.95	0.688	25,000	0.60	0.55	8	1.90	46	390
BHC - GAMMA 58899 4P (Lindane)				0.16	9999	0.001	0.000	**NO**	0.95	0.652	0.03	0.60	0.55	7	2.01	46	390
BIS(2-ETHYLHEXYL) PHTHALATE 117817 13B				2,944	3.4	0.231	0.027	**NO**	0.95	0.652	5.30	0.60	0.55	7	2.01	46	390
CHLORINE 7782505				13	7.5	7.004	0.826	**NO**	0.95	0.992	490	0.60	0.55	365	0.66	46	390
COPPER - 744058 6M Hardness dependent	0.830	0.830		4.8	3.1	0.687	0.081	**NO**	0.95	0.652	19.00	0.60	0.55	7	2.01	46	390
CYANIDE 57125 14M - Weak Acid Dissociable				1.00	1.00	0.674	0.079	**NO**	0.95	0.050	5.00	0.60	0.55	1	6.20	46	390
PHENOL 108952 10A				5,800	9999	0.109	0.013	**NO**	0.95	0.652	2.50	0.60	0.55	7	2.01	46	390
ZINC- 7440666 13M hardness dependent	0.946	0.946		90	81	1.856	0.219	**NO**	0.95	0.652	45.00	0.60	0.55	7	2.01	46	390

**Insufficient data to develop criteria value. Presented is the LOEL - Lowest Observed Effect Level*

This spreadsheet calculates the reasonable potential to exceed state water quality standards for a small number of samples. The procedure and calculations are done per the procedure in Technical Support Document for Water Quality-based Toxics Control, U.S. EPA, March, 1991 (EPA/505/2-90-001) on page 56. User input columns are shown with red headings. Corrected formulas in col G and H on 5/98 (GB).

fn: TSDCalc10.cls

APPENDIX K - REASONABLE POTENTIAL CALCULATION FOR PROTECTION OF HUMAN HEALTH

Facility: City of Edmonds WWTP
Permit No: WA-002405-8
Run Date: 7/14/2003

Parameter	Ambient Conc. (Geo. Mean)	Water Quality Criteria for Protection of Human Health	Max conc. at edge of chronic mixing zone.	**LIMIT REQ'D?**	**AVERAGE MONTHLY EFFLUENT LIMIT**	**MAXIMUM DAILY EFFLUENT LIMIT**	Estimated Percentile at 95% Confidence		Max effluent conc. measured	Coeff Variation		# of samples from which # in col. K was taken	Multiplier	Calculated 50th percentile Effluent Conc. (When n>10)	Dilution Factor
	ug/L	*ug/L*	*ug/L*		*ug/L*	*ug/L*		*Pn*	*ug/L*	*CV*	**S**	*n*			
BHC - GAMMA 58899 4P (Lindane)		0.0630	0.000	**NO**	**NONE**	**NONE**	0.50	0.65	0.03	0.60	0.55	7	0.81	0	390
BIS(2-ETHYLHEXYL) PHTHALATE 117817 13B		5.90	0.011	**NO**	**NONE**	**NONE**	0.50	0.65	5.30	0.60	0.55	7	0.81	0	390
CHLOROFORM 67663 11V		470	0.012	**NO**	**NONE**	**NONE**	0.50	0.65	5.70	0.60	0.55	7	0.81	0	390
CYANIDE 57125 14M - Total		220,000	0.008	**NO**	**NONE**	**NONE**	0.50	0.65	4.00	0.60	0.55	7	0.81	0	390
PHENOL 108952 10A		4,600,000	0.005	**NO**	**NONE**	**NONE**	0.50	0.65	2.50	0.60	0.55	7	0.81	0	390

fn: TSDCalc10.cls

APPENDIX L – WATER QUALITY BASED PERMIT LIMIT CALCULATIONS

Facility: City of Edmonds WWTP
Permit No: WA-002405-8
Run Date: 7/14/2003

Dilution (Dil'n) factor is the inverse of the percent effluent concentration at the edge of the acute or chronic mixing zone.

						Permit Limit Calculation Summary					**Waste Load Allocation (WLA) and Long Term Average (LTA) Calculations**							**Statistical variables for permit limit calculation**			
PARAMETER	Acute Dil'n Factor	Chronic Dil'n Factor	Metal Criteria Translator Acute	Metal Criteria Translator Chronic	Ambient Concentration *ug/L*	Water Quality Standard Acute *ug/L*	Water Quality Standard Chronic *ug/L*	Average Monthly Limit (AML) ug/L	Average Monthly Limit (AML) lbs/day	Max Daily Limit (MDL) ug/L	WLA Acute *ug/L*	WLA Chronic *ug/L*	LTA Acute *ug/L*	LTA Chronic *ug/L*	LTA Coeff. Var. (CV) *decimal*	LTA Prob'y Basis *decimal*	Limiting LTA *ug/L*	Coeff. Var. (CV) *decimal*	AML Prob'y Basis *decimal*	MDL Prob'y Basis *decimal*	# of Samples per Month *n*
Chlorine	46.0	390				13.00	7.50	**228**	**22.5**	**598**	598	2925	192.0	1543	0.60	0.99	192.0	0.60	0.95	0.99	30.00

This spreadsheet calculates water quality based permit limits based on the two value steady state model using the State Water Quality standards contained in WAC 173-201A. The procedure and calculations are done per the procedure in Technical Support Document for Water Quality-based Toxics Control, U.S. EPA, March, 1991 (EPA/505/2-90-001) on page 99. Last revision date

fn: TSDCalc10.cls

APPENDIX M - SUMMARY OF WET TESTING RESULTS

Table M-1. Chronic WET Test Results

Sample Date	Start Date	Lab	Test Number	Organism	Endpoint	NOEC	LOEC	MSDp
3/22/1993	3/22/1993	Beak	KJOH596	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	< 6.25	6.25	31.57%
3/22/1993	3/23/1993	Beak	KJOH595	fathead minnow	7-day Survival	50	100	7.97%
					Biomass	12.5	25	12.29%
					Weight	12.5	25	11.54%
5/24/1993	5/25/1993	Beak	KJOH500	fathead minnow	7-day Survival	50	100	17.91%
					Biomass	50	100	23.79%
					Weight	50	100	18.56%
5/24/1993 8:00	5/25/1993	Beak	SSIN598	*Ceriodaphnia dubia*	7-day Survival	50	100	
					Reproduction	25	50	2.72%
9/13/1993	9/14/1993	Beak	KJOH507	fathead minnow	7-day Survival	50	100	13.80%
					Biomass	25	50	30.08%
					Weight	25	50	22.83%
9/22/1993	9/24/1993	Beak	KJOH508	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	50	100	45.88%
11/15/1993	11/15/1993	Beak	KJOH513	*Ceriodaphnia dubia*	7-day Survival	50	100	
					Reproduction	50	100	69.09%
11/15/1993	11/16/1993	Beak	KJOH512	fathead minnow	7-day Survival	50	100	6.05%
					Biomass	50	100	31.44%
					Weight	50	100	39.98%
3/7/1994	3/7/1994	Beak	KJOH521	*Ceriodaphnia dubia*	7-day Survival	25	50	
					Reproduction	< 6.25	6.25	28.18%
3/7/1994	3/8/1994	Beak	KJOH520	fathead minnow	7-day Survival	50	100	19.35%
					Biomass	6.25	12.5	21.29%
					Weight	6.25	12.5	17.80%
5/9/1994	5/10/1994	Beak	KJOH525	fathead minnow	7-day Survival	100	> 100	10.03%
					Biomass	25	50	17.22%
					Weight	25	50	15.64%
5/23/1994	5/23/1994	Beak	KJOH526	*Ceriodaphnia dubia*	7-day Survival	25	50	
					Reproduction	25	50	59.99%
10/10/1994	10/10/1994	Beak	AQTX0041	fathead minnow	7-day Survival	50	100	25.25%
					Biomass	50	100	31.81%
					Weight	6.25	12.5	25.48%
12/7/1994	12/7/1994	Beak	AQTX0068	*Ceriodaphnia dubia*	7-day Survival	< 6.25	6.25	
					Reproduction	6.25	12.5	48.08%
12/7/1994	12/8/1994	Beak	AQTX0067	fathead minnow	7-day Survival	50	100	24.47%
					Biomass	50	100	16.53%
					Weight	100	> 100	35.41%
2/12/1995	2/13/1995	Beak	AQTX0218	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	50	100	31.63%
2/15/1995	2/15/1995	Beak	AQTX0106	fathead minnow	7-day Survival	25	50	21.67%
					Biomass	25	50	31.38%
					Weight	25	50	25.00%
4/10/1995	4/11/1995	Beak	AQTX0222	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	50	100	54.06%
4/10/1995	4/11/1995	Beak	AQTX0223	fathead minnow	7-day Survival	50	100	11.93%
					Biomass	50	100	14.05%
					Weight	50	100	16.51%
6/22/1995	6/23/1995	Beak	AQTX0269	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	50	100	46.08%
8/14/1995	8/15/1995	Beak	AQTX0297	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	50	100	38.98%
8/14/1995	8/15/1995	Beak	AQTX0296	fathead minnow	7-day Survival	100	> 100	33.11%
					Biomass	50	100	31.41%
					Weight	12.5	25	18.28%
1/15/1996	1/16/1996	Beak	AQTX0613	*Ceriodaphnia dubia*	7-day Survival	10	> 10	
					Reproduction	1.25	2.5	28.32%
2/12/1996	2/13/1996	Beak	AQTX0614	fathead minnow	7-day Survival	10	> 10	
					Biomass	10	> 10	21.44%
					Weight	10	> 10	18.40%
3/25/1996	3/26/1996	Beak	AQTX0702	*Ceriodaphnia dubia*	7-day Survival	10	> 10	
					Reproduction	10	> 10	53.43%
4/15/1996	4/16/1996	Beak	AQTX0703	fathead minnow	7-day Survival	10	> 10	
					Biomass	5	10	17.49%
					Weight	5	10	18.06%
5/20/1996	5/21/1996	Parametrix	AQTX0792	mysid shrimp	7-day Survival	2.12	> 2.12	11.27%
					Biomass	2.12	> 2.12	28.94%
					Weight	2.12	> 2.12	31.93%
5/20/1996	5/21/1996	Parametrix	AQTX0791	silverside minnow	7-day Survival	2.12	> 2.12	6.48%
					Biomass	2.12	> 2.12	21.07%
					Weight	2.12	> 2.12	22.46%
7/15/1996	7/16/1996	Parametrix	AQTX0827	mysid shrimp	7-day Survival	50	100	15.46%
					Biomass	50	100	33.84%
					Weight	100	> 100	39.26%
7/15/1996	7/16/1996	Parametrix	AQTX0826	silverside minnow	7-day Survival	100	> 100	10.10%
					Biomass	50	100	15.08%
					Weight	100	> 100	15.03%
2/5/2001 8:00	2/6/2001 15:00	Parametrix	AQTX002778	mysid shrimp	7-day Survival	100	> 100	13.97%
					Biomass	12.5	25	17.10%
					Weight	12.5	25	13.84%
2/5/2001 8:00	2/6/2001 14:00	Parametrix	AQTX002779	silverside minnow	7-day Survival	100	> 100	12.84%
					Biomass	100	> 100	20.72%
					Weight	100	> 100	18.32%
8/13/2001 7:00	8/14/2001 16:00	Parametrix	AQTX002781	mysid shrimp	7-day Survival	100	> 100	18.14%
					Biomass	50	100	18.94%
					Weight	50	100	13.53%
8/13/2001 7:00	8/14/2001 11:30	Parametrix	AQTX002782	silverside minnow	7-day Survival	100	> 100	59.42%
					Biomass	100	> 100	58.18%
					Weight	100	> 100	28.86%

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APPENDIX M (CONT'D) - SUMMARY OF WET TESTING RESULTS

Table M-2. Acute WET Test Results

Sample Date	Start Date	Lab	Test Number	Organism	Endpoint	NOEC	LOEC	MSDp	% Survival
2/22/1993	2/23/1993	Beak	KJOH598	*Daphnia pulex*	48-hour Survival	100	> 100	24.14%	75.0%
2/22/1993	2/22/1993	Beak	KJOH599	fathead minnow	96-hour Survival	25	50		0.0%
2/27/1993	2/27/1993	Beak	KJOH597	rainbow trout	96-hour Survival	50	100		35.0%
4/25/1993	4/26/1993	Beak	KJOH601	*Daphnia pulex*	48-hour Survival	6.25	12.5	26.75%	0.0%
4/25/1993	4/26/1993	Beak	KJOH602	fathead minnow	96-hour Survival	12.5	25		0.0%
4/25/1993	4/26/1993	Beak	KJOH600	rainbow trout	96-hour Survival	25	50		5.0%
6/21/1993	6/24/1993	Beak	KJOH502	*Daphnia pulex*	48-hour Survival	100	> 100	15.10%	100.0%
6/21/1993	6/22/1993	Beak	KJOH501	fathead minnow	96-hour Survival	100	> 100		95.0%
6/21/1993	6/22/1993	Beak	KJOH503	rainbow trout	96-hour Survival	100	> 100		100.0%
7/27/1993	7/30/1993	Beak	KJOH505	*Daphnia pulex*	48-hour Survival	100	> 100	15.10%	95.0%
7/27/1993	7/27/1993	Beak	KJOH504	fathead minnow	96-hour Survival	100	> 100		100.0%
7/27/1993	7/27/1993	Beak	KJOH506	rainbow trout	96-hour Survival	100	> 100		100.0%
10/11/1993	10/11/1993	Beak	KJOH510	*Daphnia pulex*	48-hour Survival	100	> 100	15.14%	90.0%
10/11/1993	10/12/1993	Beak	KJOH509	fathead minnow	96-hour Survival	50	100		0.0%
10/11/1993	10/11/1993	Beak	KJOH511	rainbow trout	96-hour Survival	100	> 100		100.0%
12/6/1993	12/6/1993	Beak	KJOH515	*Daphnia pulex*	48-hour Survival	25	50	15.09%	0.0%
12/8/1993	12/9/1993	Beak	KJOH516	rainbow trout	96-hour Survival	100	> 100		100.0%
12/14/1993	12/14/1993	Beak	KJOH514	fathead minnow	96-hour Survival	50	100		75.0%
2/7/1994	2/8/1994	Beak	KJOH517	fathead minnow	96-hour Survival	100	> 100		100.0%
2/7/1994	2/7/1994	Beak	KJOH519	rainbow trout	96-hour Survival	50	100		20.0%
2/9/1994	2/9/1994	Beak	KJOH518	*Daphnia pulex*	48-hour Survival	100	> 100	15.12%	90.0%
4/6/1994	4/6/1994	Beak	KJOH523	*Daphnia pulex*	48-hour Survival	100	> 100	27.65%	100.0%
4/6/1994	4/7/1994	Beak	KJOH522	fathead minnow	96-hour Survival	100	> 100		95.0%
4/8/1994	4/8/1994	Beak	KJOH524	rainbow trout	96-hour Survival	50	100		15.0%
6/9/1994	6/9/1994	Beak	KJOH527	*Daphnia pulex*	48-hour Survival	100	> 100	34.28%	75.0%
6/9/1994	6/9/1994	Beak	KJOH528	rainbow trout	96-hour Survival	50	100		60.0%
8/12/1994	8/12/1994	Beak	AQTX0039	*Daphnia pulex*	48-hour Survival	100	> 100	14.98%	90.0%
8/12/1994	8/12/1994	Beak	AQTX0038	fathead minnow	96-hour Survival	100	> 100		85.0%
8/12/1994	8/13/1994	Beak	AQTX0040	rainbow trout	96-hour Survival	100	> 100		100.0%
11/14/1994	11/14/1994	Beak	AQTX0065	*Daphnia pulex*	48-hour Survival	100	> 100	15.10%	100.0%
11/14/1994	11/15/1994	Beak	AQTX0064	fathead minnow	96-hour Survival	100	> 100	13.33%	92.5%
11/14/1994	11/14/1994	Beak	AQTX0066	rainbow trout	96-hour Survival	100	> 100		100.0%
1/25/1995	1/25/1995	Beak	AQTX0350	*Daphnia pulex*	48-hour Survival	100	> 100		100.0%
1/25/1995	1/25/1995	Beak	AQTX0349	fathead minnow	96-hour Survival	100	> 100	12.63%	92.5%
1/25/1995	1/25/1995	Beak	AQTX0351	rainbow trout	96-hour Survival	100	> 100		100.0%
3/14/1995	3/15/1995	Beak	AQTX0219	*Daphnia pulex*	48-hour Survival	50	100	19.81%	5.0%
3/14/1995	3/15/1995	Beak	AQTX0220	fathead minnow	96-hour Survival	100	> 100	14.90%	97.5%
4/10/1995	4/11/1995	Beak	AQTX0221	rainbow trout	96-hour Survival	100	> 100	16.79%	92.5%
5/19/1995	5/19/1995	Beak	AQTX0214	*Daphnia pulex*	48-hour Survival	100	> 100	14.47%	100.0%
5/19/1995	5/19/1995	Beak	AQTX0215	fathead minnow	96-hour Survival	100	> 100	17.20%	97.5%
5/19/1995	5/19/1995	Beak	AQTX0216	rainbow trout	96-hour Survival	50	100	15.65%	10.0%
7/10/1995	7/10/1995	Beak	AQTX0273	*Daphnia pulex*	48-hour Survival	6.25	12.5	34.58%	0.0%
7/12/1995	7/12/1995	Beak	AQTX0271	fathead minnow	96-hour Survival	100	> 100	19.29%	77.5%
7/12/1995	7/12/1995	Beak	AQTX0270	rainbow trout	96-hour Survival	25	50	13.14%	57.5%
9/20/1995	9/21/1995	Beak	AQTX0422	*Daphnia pulex*	48-hour Survival	100	> 100	11.71%	95.0%
9/20/1995	9/20/1995	Beak	AQTX0423	rainbow trout	96-hour Survival	50	100	31.87%	50.0%
10/6/1995	10/6/1995	Beak	AQTX0424	fathead minnow	96-hour Survival	100	> 100	12.03%	95.0%
11/15/1995	11/15/1995	Beak	AQTX0463	*Daphnia pulex*	48-hour Survival	100	> 100	17.99%	100.0%
11/15/1995	11/15/1995	Beak	AQTX0461	fathead minnow	96-hour Survival	50	100	26.38%	62.5%
11/15/1995	11/15/1995	Beak	AQTX0462	rainbow trout	96-hour Survival	100	> 100	10.74%	85.0%
2/12/1996	2/12/1996	Beak	AQTX0617	*Daphnia pulex*	48-hour Survival	100	> 100	20.40%	100.0%
2/12/1996	2/13/1996	Beak	AQTX0615	fathead minnow	96-hour Survival	100	> 100	8.66%	95.0%
2/14/1996	2/14/1996	Beak	AQTX0616	rainbow trout	96-hour Survival	100	> 100	8.02%	97.5%
5/1/1996	5/1/1996	Beak	AQTX0704	fathead minnow	96-hour Survival	100	> 100	12.99%	92.5%
5/20/1996	5/21/1996	Parametrix	AQTX0790	*Daphnia magna*	48-hour Survival	100	> 100		100.0%
6/19/1996	6/19/1996	Parametrix	AQTX0789	fathead minnow	96-hour Survival	50	100	11.95%	57.5%
7/15/1996	7/16/1996	Parametrix	AQTX0825	*Daphnia pulex*	48-hour Survival	100	> 100	8.28%	100.0%
7/29/1997	7/30/1997	Parametrix	AQTX1226	*Daphnia pulex*	48-hour Survival	100	> 100		100.0%
2/9/1998	2/10/1998	Parametrix	AQTX1650	fathead minnow	96-hour Survival	100	> 100		100.0%
2/9/1998	2/10/1998	Parametrix	AQTX1583	fathead minnow	96-hour Survival	100	> 100		100.0%
8/5/1998	8/5/1998	Parametrix	AQTX1898	*Daphnia pulex*	48-hour Survival	100	> 100	10.60%	100.0%
8/5/1998	8/5/1998	Parametrix	AQTX2025	*Daphnia pulex*	48-hour Survival	100	> 100	10.60%	100.0%
2/17/1999 7:23	2/17/1999 11:30	Parametrix	AQTX2117	fathead minnow	96-hour Survival	2.17	100	16.96%	55.0%
2/23/2000 7:20	2/23/2000 13:00	Parametrix	AQTX002775	fathead minnow	96-hour Survival	100	> 100		100.0%
3/10/2000 7:20	3/10/2000 13:30	Parametrix	AQTX002776	*Ceriodaphnia dubia*	48-hour Survival	2.17	100	15.36%	60.0%
2/5/2001 8:00	2/6/2001 13:00	Parametrix	AQTX002777	fathead minnow	96-hour Survival	2.17	100	26.71%	57.5%
3/17/2001 7:30	3/18/2001 12:00	Parametrix	AQTX002780	fathead minnow	96-hour Survival	2.17	100	21.54%	57.5%
2/20/2002 7:00	2/20/2002 15:45	AMEC	AQTX002854	*Ceriodaphnia dubia*	48-hour Survival	100	> 100		100.0%
2/20/2002 7:00	2/20/2002 14:45	AMEC	AQTX002853	fathead minnow	96-hour Survival	50	100	16.13%	70.0%
8/9/2002 7:00	8/9/2002 14:15	AMEC	AQTX003307	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	37.66%	90.0%
3/16/2002 7:00	3/16/2002 16:45	AMEC	AQTX003308	fathead minnow	96-hour Survival	50	100		70.0%
2/26/2003 7:00	2/26/2003 14:00	AMEC	AQTX003305	*Ceriodaphnia dubia*	48-hour Survival	100	> 100		100.0%
2/26/2003 7:00	2/26/2003 13:15	AMEC	AQTX003304	fathead minnow	96-hour Survival	100	> 100	14.50%	70.0%
3/13/2003 7:00	3/13/2003 13:00	AMEC	AQTX003306	fathead minnow	96-hour Survival	25	50	8.86%	0.0%

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APPENDIX N - EPA LIST OF 126 PRIORITY POLLUTANTS

(source: 40 CFR Pt. 423, titled "Appendix A to Part 403 - 126 Priority Pollutants")

Chlorinated Benzenes
- Chlorobenzene
- 1,2-dichlorobenzene
- 1,3-dichlorobenzene
- 1,4-dichlorobenzene
- 1,2,4-trichlorobenzene
- Hexachlorobenzene

Chlorinated Ethanes
- Chloroethane
- 1,1-dichloroethane
- 1,2-dichloroethane
- 1,1,2-trichloroethane
- 1,1,1-trichloroethane
- 1,1,2,2-tetrachloroethane
- Hexachloroethane

Chlorinated Phenols
- 2-chlorophenol
- 2,4-dichlorophenol
- 2,4,6-trichlorophenol
- Parametachlorocresol (4-chloro-3-methyl phenol)

Other Chlorinated Organics
- Chloroform (trichloromethane)
- Carbon tetrachloride (tetrachloromethane)
- Bis(2-chloroethoxy)methane
- Bis(2-chloroethyl)ether
- 2-chloroethyl vinyl ether (mixed)
- 2-chloronaphthalene
- 3,3'-dichlorobenzidine
- 1,1-dichlorethylene
- 1,2-trans-dichloroethylene
- 1,2-dichloropropane
- 1,2-dichloropropylene (1,3-dichloropropene)
- Tetrachloroethylene
- Trichloroethylene
- Vinyl chloride (chloroethylene)
- Hexachlorobutadiene
- Hexachlorocyclopentadiene
- 2,3,7,8-tetrachloro-dibenzo-p-dioxin (TCDD)

Haloethers
- 4-chlorophenyl phenyl ether
- 2-bromophenyl phenyl ether
- Bis(2-chloroisopropyl)

Halomethanes
- Methylene chloride (dichloromethane)
- Methyl chloride (chloromethane)
- Methyl bromide (bromomethane)
- Bromoform (tribromomethane)
- Dichlorobromomethane
- Chlorodibromomethane

Nitroamines
- N-nitrosodimethylamine
- N-nitrosodiphenylamine
- N-nitrosodi-n-propylamine

Phenols (other than chlorinated)
- 2-nitrophenol
- 4-nitrophenol
- 2,4-dinitrophenol
- 4,6-dinitro-o-cresol (4,6-dinitro-2-methylphenol)
- Pentachlorophenol
- Phenol
- 2,4-dimethylphenol
- 1, 2-diphenyl hydrazine (azobenzene)
- Total Phenolic Compounds

Phthalate Esters
- Bis(2-ethylhexyl)phthalate
- Butyl benzyl phthalate
- Di-n-butyl phthalate
- Di-n-octyl phthalate
- Diethyl phthalate
- Dimethyl phthalate

Polynuclear Aromatic Hydrocarbons (PAHs)
- Acenaphthene
- 1,2-benzanthracene (benzo(a)anthracene)
- Benzo(a)pyrene (3,4-benzo-pyrene)
- 3,4-benzofluoranthene (benzo(b)fluoranthene)
- 11,12-benzofluoranthene (benzo(k)fluoranthene)
- Chrysene
- Acenaphthylene
- Anthracene
- 1,12-benzoperylene (benzo(ghi)perylene)
- Fluorene
- Fluoranthene
- Phenanthrene
- 1,2,5,6-dibenzanthracene (dibenzo(a,h)anthracene)
- Indeno (1,2,3-cd) pyrene (2,3-o-phenylene pyrene)
- Pyrene

Pesticides and Metabolites
- Aldrin
- Dieldrin
- Chlordane (technical mixture and metabolites)
- Alpha-endosulfan
- Beta-endosulfan
- Endosulfan sulfate
- Endrin
- Endrin aldehyde
- Heptachlor
- Heptachlor epoxide (BHChexachlorocyclohexane)
- Alpha-BHC
- Beta-BHC
- Gamma-BHC (Lindane)
- Delta-BHC
- Toxaphene

DDT and Metabolites
- 4,4-DDT
- 4,4-DDE (p,p-DDX)
- 4,4-DDD (p,p-DDE)

Polychlorinated Biphenyls (PCBs)
- PCB-1242 (Aroclor 1242)
- PCB-1254 (Aroclor 1254)
- PCB-1221 (Aroclor 1221)
- PCB-1232 (Aroclor 1232)
- PCB-1248 (Aroclor 1248)
- PCB-1260 (Aroclor 1260)
- PCB-1016 (Aroclor 1016)

Other Organics
- Acrolein
- Acrylonitrile
- Benzene
- Benzidine
- 2,4-dinitrotolulene
- 2,6-dinitrotolulene
- Ethylbenzene
- Isophrone
- Naphthalene
- Nitrobenzene
- Tolulene

Inorganics
- Antimony
- Arsenic
- Asbestos
- Beryllium
- Cadmium
- Chromium (III)
- Chromium (VI)
- Copper
- Cyanide, total
- Cyanide, weak acid dissociable
- Lead
- Mercury
- Nickel
- Selenium
- Silver
- Thallium
- Zinc

* Total Recoverable Chromium